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Pay in Europe in Different Wage-Bargaining Regimes

Eurofound

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Abstract

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This report provides a quantitative analysis of how the features of national wage-bargaining regimes affect pay outcomes. The analysis builds on the theoretical propositions that both highly centralised and highly decentralised regimes align wages and productivity, ensuring a high level of employment, and that a high degree of coordination of wage bargaining can moderate wage increases, leading to macroeconomic stability.

Keywords

Europe, wage bargaining, pay outcomes, employment, productivity

Comments

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Pay in Europe in different wage-bargaining regimes

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European Foundation for the Improvement of Living and Working Conditions

Pay in Europe in different wage-bargaining regimes

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Executive summary

Introduction

As in all market economies, wage bargaining in the European Union Member States is fundamental to enabling labour as a factor of production to obtain its fair share of the production output (and thereby participate in prosperity) and to securing a high level of employment in the economy (thereby supporting aggregate demand and contributing to social inclusion). In the EU, around two-thirds of workers are covered by some form of collective agreement, which demonstrates the importance of wage bargaining to macroeconomic outcomes in the European social model.

This report provides a quantitative analysis of how the features of national wage-bargaining regimes affect pay outcomes. The analysis builds on the theoretical propositions that both highly centralised and highly decentralised regimes align wages and productivity, ensuring a high level of employment, and that a high degree of coordination of wage bargaining can moderate wage increases, leading to macroeconomic stability.

Policy context

Despite the crucial role that wage bargaining plays in ensuring macroeconomic stability in the Member States and, even more so, in the euro zone, wage bargaining and pay policy in the wider sense are explicitly excluded from regulation under the Treaty on the Functioning of the European Union (TFEU). Traditionally, however, the EU can intervene via accompanying policy, such as employment promotion and the improvement of working conditions. The European Parliament and the European Council can also adopt measures to ensure the application of the principle of equal opportunities and equal treatment of men and women in matters of employment and occupation.

The significance of wage bargaining has changed since the introduction of the euro in 1999. To mitigate existing macroeconomic imbalances and to avoid the emergence of new ones, long-established national bargaining regimes (based mainly on sectoral or intersectoral wage bargaining) are expected to achieve pay outcomes that retain high employment levels and economic growth in the context of increased competition.

Consequently, there has been increased pressure on regimes to take account of:

- nominal wage increases that are consistent with price stability;
- (moderate) increases in real wages in relation to labour productivity growth, taking into account the need to strengthen and maintain the profitability of capacity-enhancing and employment-creating investment;
- the heterogeneity of skills, qualifications, sectors and geographical areas during collective bargaining.

Key findings

The results indicate that the key institutional variables of the wage-bargaining regime that influence pay outcomes are the type of coordination (how coordination is achieved) and the level of wage bargaining.

- Type of coordination: Compared to uncoordinated wage bargaining, all types of coordination – pattern bargaining, intra- and inter-associational bargaining, and state-sponsored or state-imposed bargaining – result in significantly lower average pay outcomes.

- Level of bargaining: Institutional regimes that operate company-level bargaining or bargaining that alternates between sector and company level are associated with higher pay outcomes than predominantly intermediate (sector) level and higher levels of bargaining. This suggests that wage moderation occurs with increasing centralisation of bargaining.
- Both the type of coordination and the level of bargaining also affect nominal unit labour costs (ULC), which are interpreted as a measure of wage-related competitiveness (increasing nominal ULC would imply that compensation was growing faster than labour productivity). Nominal ULC growth was found to be significantly lower in regimes with higher levels of bargaining and in coordinated regimes, compared to regimes where bargaining occurs at company or local level and regimes without bargaining coordination. Hence, bargaining regimes with predominantly company- or local-level bargaining and those without bargaining coordination showed a greater loss in wage-related competitiveness.
- Real ULC, which can be interpreted as the wage share of GDP, were found to grow significantly faster in regimes where wage bargaining takes place predominantly above company level. The coordination level and type of coordination, on the other hand, leaves real ULC mostly unaffected, except where there is intra-associational or inter-associational coordination, which is associated with both lower nominal and real ULC compared to uncoordinated regimes.

Conclusion

The report's first two key findings show that uncoordinated bargaining at company level, which does not follow an objective of achieving high levels of employment in the economy, results in higher pay outcomes on average. At macroeconomic level, this would translate into welfare gains only if employment levels remained constant and macroeconomic imbalances from increased wages could be avoided. Such a situation could indeed exist if firms achieved high levels of profitability, such that there was scope to increase wages without inducing negative employment effects. Introducing some elements of company-level bargaining could then complement coordinated or higher-level bargaining and result in increasing pay outcomes in very profitable firms, without creating a great risk to an overall objective of wage moderation aimed at increasing aggregate employment.

The third key finding is that regimes characterised by higher degrees of coordination and levels of centralisation are associated with significantly lower increases in nominal ULC; in other words, productivity growth exceeds the growth of compensation costs in countries with these sorts of bargaining institutions to a greater extent than in countries with uncoordinated bargaining and company- or local-level bargaining. In contrast, real ULC are unaffected by the type of coordination and are positively influenced by levels of bargaining higher than the company level.

From these findings, the research shows that coordination and centralisation of bargaining compared to predominantly uncoordinated or company-level bargaining could result in gains for both companies and employees, resulting in a lower loss of wage-related competitiveness and an equally high or higher wage share growth. Hence, if wage moderation was seen as a strategy to increase employment in the medium and long term by mitigating imbalances and improving macroeconomic stability under European Monetary Union (EMU), then the evidence from this study suggests that such a strategy would be favoured by a wage-bargaining system with a high degree of coordination. Such a strategy would mostly apply to countries where wage growth exceeded the growth of productivity.

If keeping wage share high was seen as part of a strategy to promote demand, then the findings of this study suggest that such a strategy would be favoured by any wage-bargaining system other than a pure company-level one. Since there is a great variety of wage-bargaining traditions and institutions in the EU, achieving highly coordinated bargaining would inevitably result in institutional change in many countries.

Finally, it needs to be stressed that not all features of a bargaining system can be quantitatively measured. This analysis could not shed light on other important factors that could shape the bargaining process and its outcomes: how the various actors understand each other, the more informal dimension, their mutual trust, their convictions and long-term visions, to name but a few. Such aspects are difficult to measure and remain unaccounted for in the present analysis as no systematic data are available. This opens a wide range of new research possibilities.

Introduction

Policy background

As in all market economies, wage bargaining in the European Union Member States is fundamental to allowing labour as a factor of production to obtain its fair share of the production output (thereby supporting aggregate demand and participation in prosperity). It is also central to securing a high level of employment in the economy (and thereby social inclusion). In the EU, around two-thirds of workers are covered by some form of collective agreement (van Gyes, 2012), indicating the importance of wage bargaining to macroeconomic outcomes within the European social model.

Despite the crucial role of wage bargaining for macroeconomic stability in the Member States and, even more so, in the euro zone, wage bargaining and pay policy in the wider sense are explicitly excluded from regulation under the Treaty on the Functioning of the European Union (TFEU) (see Eurofound, 2014). Specifically, Article 153 (5) of the TFEU establishes that pay is excluded from the areas in which the EU has competences to intervene. Traditionally, however, the EU can intervene via accompanying policies, such as employment promotion or improvement of working conditions. In addition, Article 157 of the TFEU establishes legislative powers for the European Parliament and the European Council enabling them to adopt measures to ensure the application of the principle of equal opportunities and the equal treatment of men and women in relation to employment and occupation, including the principle of equal pay for equal work or work of equal value.

The role of wage bargaining changed significantly after the introduction of the euro in 1999. With no monetary policy mechanisms in individual Member States, bargained wages now affect the competitiveness of sectors exposed to direct competition in intra-European markets. In order to avoid the emergence of macroeconomic imbalances, the long-established national bargaining regimes (mainly sectoral or intersectoral wage bargaining) need to achieve pay outcomes that retain high employment levels and economic growth in the context of increased competition.

As summarised in a recent Eurofound report (2014), European recommendations have emphasised the following:

- nominal wage increases should be consistent with price stability;
- real wages should increase in relation to labour productivity growth, taking into account the need to strengthen and maintain the profitability of capacity-enhancing and employment-creating investment;
- collective bargaining should take into account the heterogeneity of labour (according to skills, qualifications and geographical area);
- the need to pursue policies to reduce the gender pay gap.

In 2013, László Andor, the then EU Commissioner for Employment, Social Affairs and Inclusion, proposed an exploratory tripartite exchange of views on wage developments with national and European social partners (Andor, 2013). This was to be done through the Commission's Employment Committee (EMCO) in order to:

> *generate a reflection on the economic, employment and social implications of wage developments across Europe, contribute to enhancing social partners' input in European economic governance and provide an opportunity for the EU institutions to benefit from the national social partners' expertise.*
>
> (European Commission, 2012a, p. 1)

However, this proposal was met with scepticism by the social partners. The trade unions in particular were concerned that the Commission favoured more intervention in wage bargaining, which would have an impact on the autonomy of the social partners. The meeting did go ahead on 1 February 2013, discussing wage developments, productivity and

prices, wages, employment and unemployment, and wage inequalities. However, employers and trade union representatives criticised the meeting's format and purpose and showed no interest in regular meetings of this kind.[1] Nevertheless, EMCO felt that this had been a useful exchange of views and that the meeting had helped to improve its understanding of the social partners' views.

Collective bargaining processes have been targeted in EU-level recommendations to several national governments during the financial crisis. Specifically, the EU's new economic governance measures, which aim to stabilise the European economy in the context of the economic crisis, have had a greater or lesser impact on individual EU Member States depending on the extent to which individual economies are weathering the crisis. The 'six pack' of EU measures came into force in December 2011, comprising five regulations and one directive. They cover fiscal and macroeconomic surveillance under the new Macroeconomic Imbalance Procedure and strengthen the EU's Stability and Growth Pact. Further, the Euro Plus Pact commits signatories to stronger economic coordination for competitiveness and convergence, with concrete goals agreed and reviewed on an annual basis by heads of state or government. The pact is integrated into the European Semester cycle of policy governance, and the Commission monitors the implementation of commitments.

Outline of the current study

This project provides a quantitative analysis of how the features of national wage-bargaining regimes affect pay outcomes.

The report starts with a brief discussion of the theory of the institutional features of wage-bargaining regimes and their likely effects on pay outcomes in aggregate economies.

Based on central theoretical arguments, an institutional framework is then developed to derive hypotheses on how the institutions of a wage-bargaining regime affect pay outcomes. The discussion focuses on collectively agreed nominal and real wages, nominal and real labour compensation, unit labour costs and wage drift; data on these are consistently available for all Member States. In the descriptive analysis, brief descriptions of the wage-bargaining institutions in 27 Member States are provided, as well as the bivariate relationship between wage-bargaining institutions and pay outcomes.[2]

As part of the analytical framework, other labour market institutions and economic policy that affect the relationship between bargaining and pay outcomes are discussed, particularly macroeconomic and demographic circumstances.

In the empirical analysis, the hypotheses are tested on the basis of a large panel dataset of Member States with multivariate methods. In contrast to the simple bivariate relationships shown in the analytical framework, these models allow the impact of macroeconomic conditions, policy variables and the characteristics of the production system to be controlled for. They result in estimates on the link between bargaining and pay outcomes, conditional on many other variables.

[1] See Eurofound's European Observatory of Working Life (EurWORK) for details on the concerns of the trade unions at **http://www.eurofound.europa.eu/observatories/eurwork/articles/industrial-relations-other/social-partners-assert-their-collective-bargaining-autonomy**

[2] A similar dataset describing the bargaining institutions in Croatia was not available.

1 Theories of wage-bargaining regimes and pay outcomes

Theories of wage formation

Standard microeconomic theory

Following standard microeconomic theory, wage formation follows a clear relationship linking productivity, wages and labour demand, in which wages correspond to the marginal productivity of labour.[3] In its simplest form, this theory posits that a firm maximises profits, which are equal to the sales from its goods (sold at given prices under perfect competition) minus the costs of its factors of production (capital and labour, specified in a production function). Typically, it is assumed that the firm's capital stock is constant in the short run, so that profit-maximising behaviour determines the optimal level of production at which a marginal worker's contribution to profit is equal to that worker's wage.[4] The marginal condition sets the point at which an individual firm's output expansion should stop; if growth continues such that marginal revenues no longer exceed the costs of marginal labour input, profitability would fall.

Although the model is very simplistic, it generates some plausible conclusions about the relationship between productivity and wages.

- If worker productivity increases while wages remain constant, this will increase labour demand, because a further extension of production will increase profits.
- Given a fixed labour supply, the increased labour demand would result in higher pay until a new profit-maximising equilibrium is reached, at which point wages again equate to marginal productivity.

The clear implication from standard microeconomic theory is that wages follow the development of productivity. If wages grew above productivity, profit-maximising firms would inevitably reduce employment and increase capital intensity. In contrast, growth of wages below the growth of productivity is often thought to generate employment growth, all other things being equal. In the context of the crisis in some Member States, an approach of wage moderation is seen as one of the key instruments to regain competitiveness and induce sustainable macroeconomic growth in the countries affected by the crisis (Schulten, 2014).

Calmfors and Driffill model

While the standard microeconomic model may be a useful representation of the efficient allocation of factors of production and the growth of wages and labour compensation, particularly in the longer term, the short- and medium-term relationship between employment, labour productivity and wages depends on the outcomes of the wage-bargaining regimes, as well as other social policy measures such as minimum wages or unemployment benefits. Since bargained wages are aligned to anticipated output and productivity, growth of bargained wages may indeed differ from the growth of productivity.

[3] A standard textbook representation of the microeconomics of labour demand can be found, for example, in Borjas (2010, Chapter 3), Hammermesh (1993, Chapter 1) or Franz (2009, Chapter 3).

[4] In the long term, both factors of production, capital and labour, would be allocated according to their contribution to production for a given production technology. Following standard microeconomic assumptions, marginal revenues to both factors of production would equate to their marginal products, exhausting all gains from production to pay the factors.

In theory, employment would decline if wage growth exceeded productivity growth at sector or aggregate level, unless there was an impact on price levels as firms increased product prices accordingly to maintain or restore profitability. Alternatively, if monetary policy restrained price-level impacts, or these were limited to certain sectors of the economy, high wages would reduce employment in the economy or specifically in some of its sectors. Either way, the real wage is likely to realign marginal productivity to wages; if monetary policy allowed for inflation, nominal wage increases would not result in real wage increases in the medium term. If monetary policy aimed to avoid inflation, aggregate unemployment would increase and put downward pressure on wages in subsequent periods.

This short- and medium-term interplay of wages, productivity and employment suggests that aggregate economies with a highly centralised system of wage negotiations are likely to achieve lower unemployment rates. In such economies, bargained wage growth exceeding productivity would result either in higher prices for goods, which would offset any increase in real wages, or create aggregate unemployment, which would result in wage growth below productivity growth in the next period to realign wages and productivity.

Calmfors and Driffill (1988) extended this view to a non-linear relationship between the degree of centralisation of the bargaining system and employment levels. Under this model, both highly centralised and highly decentralised regimes align wages and productivity, ensuring a high level of employment, while intermediate levels of centralisation (such as industry-level wage bargaining) tend to result in higher wages, greater unemployment and lower macroeconomic growth. In addition, the main reason that a decentralised system of negotiations, for example at firm level, would lead to superior employment outcomes is that individual firms would not be able to increase prices in goods markets very easily. Rather, they would simply lose market share to competitors offering close substitutes for their products, which limits the wage growth at firm level.

This model has been put forward to explain why countries with decentralised wage bargaining, such as the United States, achieved well-aligned wage and productivity increases, while coordinated economies with industry-level wage bargaining tended to experience wage increases above productivity growth, resulting in a poor employment performance. If negotiations take place at sector level, there is no mechanism restraining wage setting to increases below or close to productivity growth.

While the essence of the Calmfors and Driffill model dominates mainstream economic thinking in this area, more recent extensions to this literature (such as Fitzenberger and Franz (2003), who consider the insider–outsider problem of wage negotiations) cast doubt on the idea that a fully decentralised system necessarily leads to superior employment outcomes than an intermediate system operating at sector level. However, at the other end of the spectrum, there remains little doubt that a highly centralised system of wage bargaining would aim for outcomes that avoid high levels of unemployment or price effects by demanding wage increases in line with average productivity growth in the economy. As with a minimum wage applying to the entire economy, aggregate bargaining outcomes would still affect sectors differently; some sectors would then receive wages below productivity growth and others above it. However, labour mobility would achieve an equilibrium in which wages would grow in line with real productivity and average nominal wages would differ from real wages only by average inflation.

Extensions to Calmfors and Driffill

Coordination

A fundamental problem with the prediction by Calmfors and Driffill is that it was not able to explain the relatively favourable macroeconomic performance of many countries operating intermediate-level bargaining. In spite of the stability of the bargaining regime, unemployment has fallen dramatically in countries with intermediate-level bargaining, such as Germany and the Netherlands, which was indicated soon after the publication of the Calmfors and Driffill paper

(Soskice, 1990). Many subsequent studies therefore focus on alternative institutional features of bargaining to explain diverging labour market outcomes since the late 1980s.

One important additional feature of wage bargaining is the degree to which it is actively coordinated across the economy by trade union and employer organisations or, more widely, by the organisational structures for wage bargaining, which can vary from country to country. While US economic literature discusses wage bargaining as a microeconomic problem of individual firms and trade unions, which aim to maximise the microeconomic utility of their members, union behaviour in Europe usually also considers macroeconomic outcomes (Pencavel, 1985, p. 216). These objectives are achieved through coordination of wage bargaining as the:

> *capacity and willingness of negotiators in individual bargaining units to reflect the joint impact of bargaining outcomes on the state of the national economy.*
>
> (Scharpf and Schmidt, 2000)

Soskice (1990), in particular, took this view, distinguishing between the formal level at which collective bargaining agreement was achieved and the degree of macroeconomic coordination. Based on cross-country evidence, for example comparing highly decentralised bargaining systems such as Japan and intermediate-level bargaining systems such as those in the Netherlands and Germany, coordinated wage bargaining reduces the incentives of unions in individual firms or sectors to benefit from wage restraints in others, as excessive wage claims in one sector would have repercussions on other sectors of the economy (see also Iversen, 1999). Lindgren (2005) argued that wage coordination is separable from the degree of centralisation (in other words, the level at which wage settlements are formally concluded) and further distinguished between coordination initiated in the corporatist sector and coordination led by the state.

While coordination of bargaining was initially discussed in the same way as the degree of centralisation, as a one-dimensional variable indicating whether it took place at a low, medium or high level (Soskice, 1990; Hall and Franzese, 1998; Iversen, 1999), Traxler (2003) extensively discussed coordination in terms of qualitative institutional differences, in particular how the process of coordination is achieved and whether it is vertical and horizontal. Vertical coordination refers to the coordination of individual bargainers (firms or sectors) across levels of bargaining of both employer associations and unions (p. 197). In contrast, horizontal bargaining aims to satisfy collective interests such as employment and price stability and requires 'bargainers to coordinate their strategies' (p. 199), which might involve state intervention to enforce macro-coordination.

Traxler identified five main types of coordination:

- state-imposed coordination;
- state-sponsored coordination;
- inter-associational coordination;
- intra-associational coordination;
- pattern bargaining.

While this offers a classification of the institutions involved in coordination, including the state as a macro-coordinator, both state-imposed and voluntary coordination can be achieved with very different mechanisms, such as bargaining in particular sectors, as occurs in Germany and Austria, with a 'pilot' function or via central mechanisms (tripartite or bipartite councils) preparing negotiations at lower levels, for example, sector level in the Netherlands (Traxler, 2003, p. 203).

International competition

While the level of collective bargaining is still an important variable when explaining differences between bargaining regimes and their impact on pay outcomes, there is some discussion in the economic literature suggesting that the introduction of the euro as well as increased global competition have made the particular system of wage formation less relevant for the alignment of wages and productivity (Hall and Franzese, 1998; Pérez, 2002).

Danthine and Hunt (1994), building on the work of Calmfors and Driffill, suggested that when consideration of the wage-bargaining process is extended to open economies, the key results from the earlier literature (the relative superiority of coordinated wage negotiations and the notion that industry-level wage bargaining results in poor labour market outcomes) may not apply when sectors are exposed to international competition.

> *If the force of international competition is sufficiently strong ... the margin for manoeuvre left to the unions decreases considerably.*
>
> (Danthine and Hunt, 1994, p. 537)

Thus, global competition can result in a clearer orientation of wage setting to reflect productivity changes, even when operating at sector level. As argued by Martin (1999), a possible effect of introducing the euro would be to stimulate international convergence of bargaining, thereby bringing wage outcomes closer to those of decentralised negotiations (as in the United States), unless, of course, there were a shift towards sectoral or fully coordinated negotiations at the aggregate EU level.

However, as was discussed in a study by Eichhorst et al (2011), cross-border coordination of collective bargaining is still not well established among trade unions (p. 33), which is attributed to the substantial differences in national systems of industrial relations and bargaining practices. The authors saw the main barriers to coordinated bargaining under European Monetary Union (EMU) in the decreasing role of sector-level bargaining in most western European Member States, and the weak, primarily company-based bargaining institutions in the eastern European Member States. In addition, there is also a lack of interest from employers to match cross-country coordination (p. 37). Recently, Marginson (2013) found that conditions for coordinated bargaining across borders actually worsened because of the weaker articulation within national bargaining systems affecting most Member States after the recession.

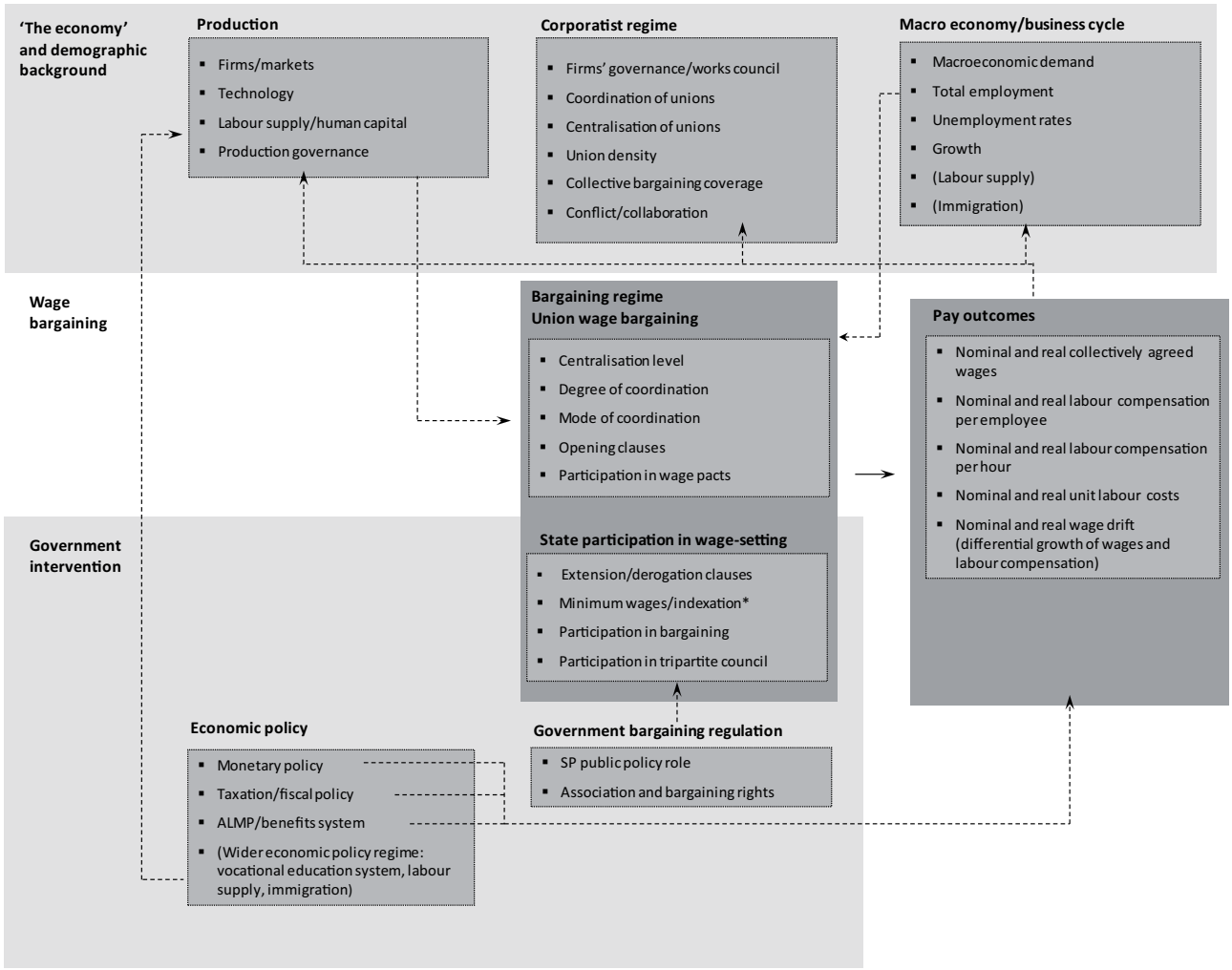
Conceptual framework of wage-bargaining regimes and pay outcomes

Wage-bargaining regime

In the following section, a conceptual framework is developed with hypotheses about how the characteristics of a wage-bargaining regime affect pay outcomes, which is summarised in Figure 1. Although regional and sector variation might have increased, particularly following the economic crisis, which altered wage bargaining in many Member States, regimes are understood as distinctive national systems affecting the level of centralisation and coordination of bargaining, the mode of coordination and other bargaining institutions, including state interventions, following Visser (2013a).

The framework summarises the main features of the bargaining regime in order to derive hypotheses about how country-specific institutional arrangements – such as the centralisation of wage bargaining, the degree and mode of bargaining coordination, wage pacts and opening clauses – may affect pay outcomes such as the growth of real and nominal wages, unit labour costs and wage drift.

Figure 1: Conceptual framework



*Not included in the analysis as minimum wage coverage was not available consistently for the full time series.
Source: *Authors' own representation*

These institutional wage-bargaining arrangements combine union wage bargaining and the participation of government in the formation of wages. The following key variables are considered:

1. Union and employer wage bargaining:
   - centralisation level;
   - level of coordination;
   - type of coordination;
   - opening clauses;
   - participation in wage pacts.
2. Government intervention in wage bargaining:
   - extension and derogation clauses;
   - participation in tripartite councils.

In addition to the characteristics of the wage-bargaining regime, a great variety of other labour market institutions and government economic policies affect both bargaining and pay outcomes. The framework considers these as well as macroeconomic conditions, including the economic cycle, aggregated unemployment and characteristics of the national production regime (market structure, technology and the specific nature of the human capital available for the production system). These variables are described briefly and will be included as control variables when testing the empirical hypotheses.

Employers engaging in multi-employer bargaining

In many countries, collective bargaining is regulated by national law, which frames how trade unions and employer associations can legally conclude collective agreements, or how tripartite agreements of the social partners and the government can be achieved. Recognition of union wage bargaining at firm or sector level was established in Germany as early as 1918 with a collective agreement between 21 commercial and industrial employer associations and seven unions (Stinnes-Legien-Abkommen), reflecting the importance of unions in an economy with private firms, when reformists aimed at the nationalisation of key industries.

Regulatory frameworks evolved and often codified further features of the bargaining system, such as the level of bargaining (as in the Scandinavian countries and France after 1982), timing, frequency and duration of agreements, and particular mechanisms, for example indexation (as in Luxembourg) or maximum nominal wage growth (as in Italy). In all countries, unions represent workers when employers aim to change terms and conditions in a defined 'bargaining unit', but in many countries, the level of bargaining is not set, and the system allows for both company-level collective agreements and higher-level bargaining between a trade union and an employer association, for example at sectoral level (as in Germany).

Where the adoption of higher-level collective bargaining is not compulsory, it is likely that employers engage in multi-employer bargaining at higher levels because of the efficiency gains compared to firm-level bargaining for firms above a certain size. While one would expect small businesses not to engage in bargaining because the employees and management are constantly working together, there are clear benefits for larger organisations in joining employer associations, other than collective bargaining, such as representation, access to resources and standard setting. Clearly, medium-sized firms would find it costly to acquire information on pay developments in different job roles and then adjust the wages of hundreds of employees accordingly. It is obviously more cost-effective to adopt negotiated wages as accepted by trade unions and employee associations. Above a certain size, there may be a reverse tendency of firms to set up firm-level agreements or to depart from multi-employer wage bargaining if the gain in company flexibility outweighs the costs of setting up their own agreements (as occurred in Volkswagen, for example).

There is evidence, based on the German Establishment Panel (Jensen and Rässler, 2007), that collective bargaining leads to improved firm performance. However, the authors of this report feel that obtaining estimates of the firm-level benefits accruing from the participation in collective-bargaining agreements via employer associations is difficult due to the nature of collective agreements as a public good: firms outside of collective bargaining would still be able to follow bargaining outcomes, which would not involve further costs.

Pay outcomes

Definitions

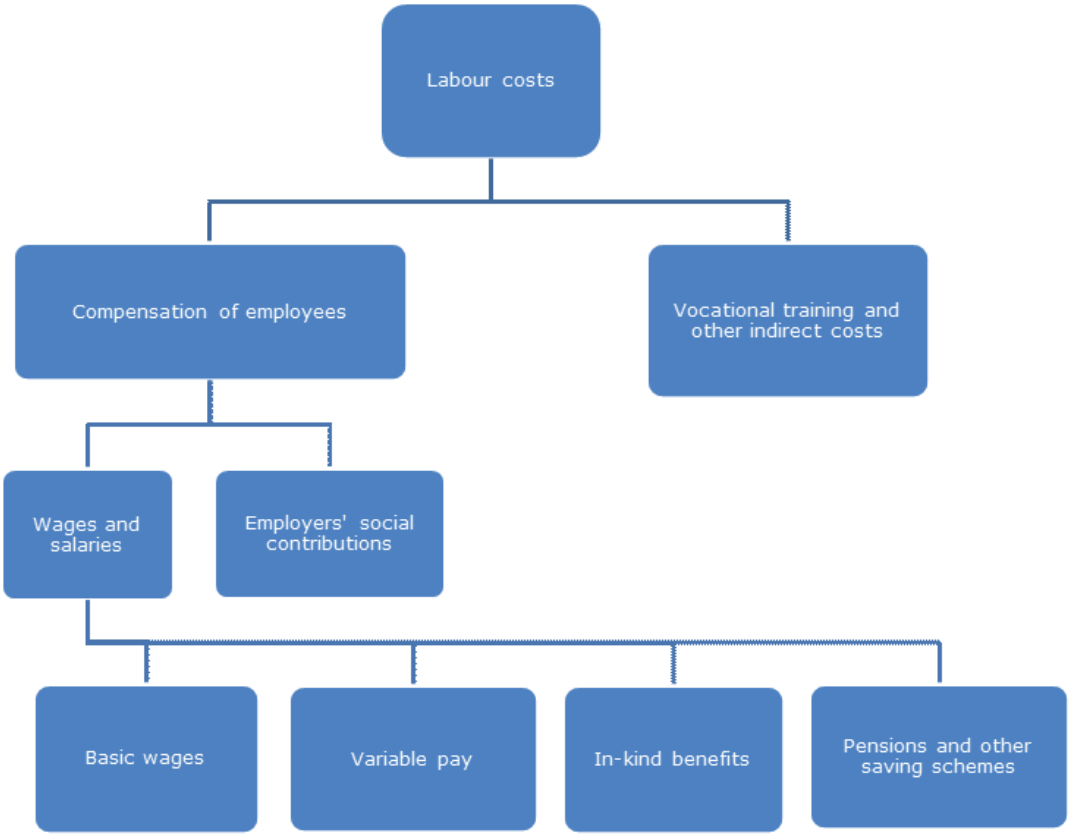
In researching the link between the institutions of the bargaining regime and pay outcomes, this report focuses on data on negotiated wages taken from Eurofound's database on collectively agreed pay, relating to increases in basic wages negotiated between social partners at various levels. However, although negotiated pay is the dominant factor, it is one of several contributing to the actual compensation of workers or per unit of labour input, data that can be obtained in harmonised time series from the national accounts – for example, the European Commission's annual macroeconomic database (AMECO). Indeed, in some countries, collectively agreed wages provide a base figure that is typically supplemented by a higher rate negotiated on an individual basis, or by bonuses and in-kind benefits. This results in a considerable 'wage drift', a deviation of the growth in wages from the growth in actual compensation.

Another interesting and more recently discussed policy issue is the interaction between collectively agreed pay and variable pay, which is primarily subject to firm-level bargaining, although there is some tendency for performance-related pay to become subject to social dialogue and collective bargaining (Eurofound, 2011b). Some recent studies suggest that in light of limited influence on workers' core pay, which, for example, is controlled under centralised bargaining regimes, employers are making increasing use of variable pay in order to decentralise national or sectoral bargaining agreements (see, for example, Kalmi et al, 2012). While some sectors, such as the service sector, have historically been associated with performance-related pay, in the past few years other sectors, including the public sector, have begun to take account of team or individual performance (see Marsden (2009) for an example of performance-related pay in the UK public sector).

A brief overview of measures of the pay outcomes used in this report follows. According to Figure 2, which follows standard OECD and Eurostat conventions:

- labour costs encompass employee compensation as well as vocational training costs and other expenditures;
- compensation of employees includes wages and salaries and employers' social insurance contributions;
- wages and salaries include fixed and variable pay and in-kind benefits, such as meal vouchers, staff housing and company cars.

Figure 2: Pay outcome variables



Source: *Authors' own representation*

Outcome variables used in empirical models

Collectively agreed pay refers to basic wages negotiated between social partners. Since it is a direct outcome of negotiation between social partners, it is very likely to vary across different wage-bargaining regimes. However, as already mentioned and as shown in Figure 2, wages and salaries include elements that are traditionally not negotiated by unions. Therefore, the growth of actual compensation is likely to differ from the growth of basic wages, resulting in considerable wage drift.

Labour compensation is defined as the sum of gross wages and salaries and of employers' social insurance contributions. In addition to basic wages, it includes variable elements of pay (such as performance-related pay or profit-sharing schemes), overtime payments, allowances, and benefits in cash and kind. However, in contrast to labour costs, it does not include indirect costs such as vocational training and recruitment costs. In the empirical models, labour compensation per unit of labour input is captured by two variables:

- compensation per hour, defined as the total compensation of employed persons divided by total hours worked (from data supplied by the Conference Board's Total Economy Database, the authors' main source);
- compensation per employee (from AMECO).

Labour compensation can be expressed in nominal or real terms. As it includes employees' and employers' social contributions as well as income tax, compensation is only an approximate measure for individual earnings, as net earnings are affected by taxes and the benefit system. By including the implicit tax rate on labour as a covariate, the

authors aim to link clearly the impact of wage-bargaining regimes on the take-home pay of employees. The implicit tax rate on labour measures the effective average tax burden directly or indirectly levied on labour income. It is given by dividing direct and indirect taxes on labour paid by employers and employees by the total compensation of employees. As such, it approximates an average effective tax burden on labour income in the economy. One must keep in mind that the implicit tax rate may hide important variations in effective tax rates across different household types or at different wage levels.

Unit labour costs (ULC) measure the average cost of labour per unit of output and can be expressed in nominal or real terms. Nominal ULC are usually expressed as the ratio of total nominal labour costs to real output. Nominal ULC are subject to general increases in prices across the economy, as the numerator is expressed in nominal terms while the denominator is expressed in real terms. To account for the changes in prices, total labour costs can be deflated with the gross domestic product (GDP) deflator. Consequently, real ULC are expressed as the ratio of total real labour costs to real output (or, similarly, as the ratio of nominal labour costs to nominal output). This is equivalent to the wage share. ULC represent the link between labour cost and labour productivity and therefore are commonly used as a measure of competitiveness.

Wage share is the remuneration of labour compared with the remuneration of capital.

Wage drift denotes the difference between basic wages (collectively agreed pay) and actual wages and salaries. It can result from overtime or increased bonuses.

Links between the different pay outcome indicators

While levels and growth rates of wages and actual labour compensation, in particular in real terms, can be understood as representing workers' participation in production, the interpretation of nominal and real ULC as indicators of pay outcomes is not straightforward, especially not in the longer term. Following standard microeconomic assumptions, firms would substitute labour for capital in order to achieve the most efficient production technology if the cost of labour (relative to that of capital) increased above marginal labour productivity. As the least productive jobs were destroyed, the total number of hours worked would fall and, hence, labour productivity as measured by GDP per hour worked would increase. As a consequence, while one would expect ULC to rise because of higher wages, the decrease in labour demand would mitigate this and might even result in lower ULC in the longer term, as occurred in Sweden in the 1990s.

In a perfectly competitive economy, an increase in labour cost above marginal productivity would result in increased unemployment. Employers would substitute capital for labour (in other words, increase capital intensity and reduce employment) so that labour cost equalled marginal product. If capital and labour were easily substitutable, which would be the case for tasks that could be automated, then employment would fall sharply and ULC would decrease, as the increase in hourly rate would be compensated by a decrease in labour input. If capital could not very easily replace labour, then the effects on employment would be less severe and total remuneration would increase, as would ULC.

Under the assumptions of imperfect competition and asymmetry of information, actual compensation can be below marginal productivity and set according to the respective bargaining power of employers and employees. In addition, extensions of the standard microeconomic theory could further explain gaps between wages and productivity.

- Implicit wage contracts (Newbery and Stiglitz, 1987): Assuming different attitudes toward risk – for example, that workers are risk-averse with regard to their wage income and firms are risk-neutral with regard to labour cost – firms may have an incentive to protect their workers' wages against risks associated with stochastic productivity shocks (unpredictable changes in factors that affect productivity) throughout the duration of the contract. As a consequence, risk-averse workers will be prepared to accept a non-stochastic (or secure) wage lower than the expected value of a stochastic wage that moves in line with productivity.

- Labour turnover costs (Lindbeck and Snower, 1988): Labour turnover costs, such as costs related to the hiring, training and firing of employees, affect the inflow and outflow of employees and give employed workers bargaining power. If outsiders are not considered competitive enough (either because they have been out of work for a long time or do not have the necessary skill levels), then naturally their role in pushing down the wages of insiders is diminished. As a consequence, insiders can negotiate wages that are above productivity, and employment will be lower and show stronger adjustment inertia in the sense that the current employment is, to a large extent, determined by the employment in the previous period.
- The minimum wage: Minimum wages can be set above the productivity level as employment effects depend first on the degree of substitution between workers for whom the minimum wage is binding and other workers, and second, on the structure of labour demand (perfect competition or monopsony (a market situation in which there is only one buyer)).

Depending on the actual gap between the development of wages and productivity, increases in wages, as long as they remain below marginal productivity, would not reduce employment. Consequently, an increase in labour costs triggered by bargaining would be expected to result in an increase in ULC at given employment levels. However, as cost of labour includes not only wages and salaries paid to employees but also non-wage costs, such as employer social contributions, training and recruitment costs, ULC do not only reflect compensation levels but also features of the tax system. Tax policies can directly affect ULC and consequently mitigate or exacerbate the effects of wage bargaining on pay and employment outcomes.

In addition, some of the features of the tax system (such as the labour tax rate) may affect bargaining on pay and compensation, as a higher tax wedge would imply lower benefits to bargaining.[5] High employee social contributions and income tax rates would reduce the net benefits accruing to workers resulting from an increase in gross wages, while high employer social contributions would exacerbate the potentially negative effect of a wage increase on employment levels. Tax reforms aiming to reduce ULC may encourage wage bargaining, which could result in wage increases partially offsetting the decrease in labour costs. For instance, following a shift from national insurance contributions to value-added tax (VAT), unions would be expected to bargain for an increase in wages.

Therefore, there is no way to predict what would be the impact of different bargaining regimes and outcomes on ULC, as opposed to predictions on wages and actual labour compensation.

However, under the assumption of (relative) employment stability, nominal ULC are often interpreted as a measure for wage-related competitiveness (increasing nominal unit labour costs would imply that compensation was growing faster than labour productivity). Taking such a view suggests that regimes with decreasing nominal ULC gain competitiveness relative to other regimes, which would improve their position in the longer term, while real ULC (as a measure for workers' participation in production) could remain the same or increase.

[5] As with labour taxes, the national systems of social assistance, especially the level and design of unemployment benefits, are important social policy mechanisms affecting reservation wages and therefore implicitly wage bargaining. While passive labour market policy spending as a percentage of GDP (and hence, the 'generosity' of unemployment benefits given unemployment levels) can be included as a covariate in multivariate models, the variable proved insignificant in multivariate models.

Pay outcomes and aggregate demand

There is also a need to establish the link between pay outcomes and aggregate demand. Among other factors, aggregate demand depends primarily on the disposable income of the population, and a substantial share of individual income is derived from wages and pay. Therefore, growth rates in wages and actual labour compensation can also be interpreted to represent changes in aggregate demand. However, as with ULC, this link is not clear-cut. Intuitively, total labour income is not only a function of wage rate but also of employment levels, so that the direction and magnitude of the impact on demand of a change in wages depends on the effects on employment levels. Therefore, the impact of changes in wages on aggregate demand depends on whether the wage growth is 'employment neutral' or results in downward adjustments to employment levels.

- If employee compensation is set below marginal productivity, then increasing wages would increase total labour income and, hence, the demand for goods. To meet this increased demand for goods, firms would increase employment, which would translate into larger total labour income and stimulate the economy.
- If compensation is close to marginal productivity, then increasing wages may have detrimental effects on employment, as firms would have to make the least productive workers redundant and increase the capital intensity of production in order to stay in business. The impact on aggregated labour income (and thus on the demand for goods) would depend on the magnitude of the substitution of capital to labour.

Most importantly, the impact of a change in the wage level on domestic demand depends on the relative marginal propensity to spend (either through consumption or investment) out of wages and profits. Indeed, all other things being equal, an increase in wages will lead to a decrease in profits, and vice versa. To the extent that the propensity to spend out of wage income is greater than the propensity to spend out of profits, a rise in wages will induce an increase in total demand, while a fall in wages will bring about a decrease in total demand. In addition, it should also be noted that domestic demand is not only affected through the average wage level of the whole labour force, but also through the distribution of wages, in the sense that liquidity-constrained low-wage earners have a higher propensity to spend out of disposable income than the higher income groups, who can spend on the basis of their disposable as well as expected future income.

Nominal and real wages

Wage bargaining affects the economic value of work in monetary terms, in euro or other currencies in Member States, for specified labour inputs over a particular time, for example full-time employment at given hours of work in a week or month. In contrast, real wages express the monetary values of wages in terms of the goods and services that can actually be purchased on the basis of bargained monetary wages. As the price level in the economy changes constantly, the development of real wages provides a good measure of the living standards of people in paid employment over time.

- Nominal wage developments have been observed to be relatively rigid in that changes resulting from exogenous shocks, price-level changes or unemployment do not usually result in nominal wage adjustments if people remain in employment. However, labour market adjustment caused by an employment decrease, unemployment and re-employment indeed resulted in adjustments to nominal wages at aggregate levels in countries strongly affected by the Great Recession, such as the Baltic states, Greece and Ireland.[6]

[6] See Table 1 in Chapter 5 of *Employment and social developments in Europe 2012* (European Commission, 2012b).

- As price levels in the domestic economy (as well as changes in the exchange rate where applicable) can lead to substantial differences between the development of nominal and real wages, real wages can more clearly show how wages respond to underlying changes in production and the labour market. Real wages more clearly adjust, for example, as nominal wage growth remains moderate in times of high unemployment to allow more people to regain employment. If employment levels are high, real wages tend to grow in line with underlying changes in macroeconomic aggregates such as real economic growth or labour productivity.

Nominal and real wage growth rates follow productivity developments in firms, sectors or the aggregate economy and differ by the average growth in price levels in the domestic economy due to inflation and changes in foreign exchange rates. Substantial differences between the growth rates of nominal and real wages point to high inflation – in other words, bargaining no longer results in improvements to living standards or domestic demand, but itself causes a price-level effect via the increased wages. In a system of fixed exchange rates or within the EMU, the price-level effects are limited by a fixed inflation target. Real wages increasing above the real growth of productivity would result in unemployment, and real wages would flexibly adjust downwards to allow for a reallocation of labour in the economy.

Pay outcomes and aggregate demand in the open economy

In the open economy, pay outcomes also affect domestic demand through their impact on external trade and international competitiveness. For example, if an EMU country aims to increase wage levels in order to stimulate domestic demand, this will be expected to have negative effects on its net exports because its international competitiveness will decrease through a rise in ULC. In contrast, a country outside the EMU has the option to let its foreign exchange rate depreciate to counteract the rise in prices denominated in the local currency.

These effects point to different outcomes: a wage increase will increase domestic demand and decrease net exports; conversely, a wage decrease will decrease domestic demand and increase net exports. If the effect on domestic demand dominates the effect on exports, the net impact of a wage increase will be a rise in total demand (and vice versa), indicating a wage-led regime. If the effect on exports dominates the effect on domestic demand, the net effect of a wage increase will be a fall in total demand (and vice versa), indicating an export-led regime. It is an empirical matter to investigate whether a specific country falls under a wage-led or profit-led regime.

Aggregate demand and the business cycle

As with real wages and profits, aggregate demand further varies with the conditions of the business cycle. In times of strong output gaps, labour productivity tends to decrease. If this cyclical drop were to be followed by a reduction in wages, this might have a negative effect on aggregate demand (especially if one assumes that poor prospects for demand growth reduces investment), thereby widening the output gap.

From this point of view, wages adjusting flexibly to changes in productivity could trigger further macroeconomic imbalances. If an increase in net exports resulting from increased international competitiveness was not the outcome of the adjustment of ULC, then internal demand would be reduced further. In the current debate, dominated by the supply-side view of wages as a cost factor, this important function of wages for domestic demand and social cohesion is often not sufficiently taken into consideration.

Data sources

The purpose of this study is to estimate empirically the relationship between characteristics of the wage-bargaining regime and pay outcomes. In order to provide an accurate picture of these variables for all Member States, a large set of empirical macroeconomic data was collected. The main sources for this exercise are listed below.

- Quantitative and qualitative data on the characteristics of wage-bargaining regimes were taken from Jelle Visser's (2013b) Database on Institutional Characteristics of Trade Unions, Wage Settings, State Interventions and Social Pacts (ICTWSS). It contains data for 34 countries between 1960 and 2012 and has been described as 'the most comprehensive collection of variables and indicators in the field of industrial relations for the EU and OECD Member States' (Eurofound, 2014, p. 35).
- For data on pay outcomes, Eurofound's quantitative information on collectively agreed pay developments from 1998 onwards was used, plus other related pay data.[7]
- Further pay outcomes, such as labour compensation per employee and ULC, were taken from the AMECO database of the European Commission's Directorate-General for Economic and Financial Affairs (DG ECFIN), which contains more than 700 variables for the EU27, the euro zone, EU candidate countries as well as other OECD countries (Australia, Canada, Iceland, Japan, Korea, Mexico, New Zealand, Norway, Switzerland and the United States) from 1960 to 2014.
- Further institutional variables were obtained from several databases held by the Commission:
    1. the labour market and wage development database (LABDEV), which contains detailed information on the labour market and labour cost side – covering both wage and labour cost developments for the EU27 Member States, mainly drawing on statistics from AMECO, the European Central Bank and the OECD – and is updated on an annual basis;
    2. the labour market reform database (LABREF), which provides information on labour taxation, unemployment, welfare-related benefits, active labour market programmes, job protection, disability and early retirement schemes, wage bargaining, working time organisation, immigration and mobility.
- Further macroeconomic variables, such as demographics, trade data, qualifications of the labour force, capital stock, labour compensation and labour productivity,[8] were obtained from AMECO, OECD, Eurostat and Conference Board data covering the period up to 2013. These data were either used as index measures or internationally adjusted using purchasing power parities (PPP),[9] resulting in 'international' dollars that were adjusted to 2013 real prices.

[7] Available on Eurofound's collective wage bargaining web portal, **http://eurofound.europa.eu/observatories/eurwork/collective-wage-bargaining/context**.

[8] GDP per hour of work in the economy (according to the Conference Board) or per person employed (according to AMECO).

[9] The PPPs used are based on the Èltetö-Köves-Szulc (EKS) method, which Eurostat and the OECD use for both basic PPPs and aggregation (see Eurostat and OECD, 2005).

While institutional data on wage-bargaining regimes are available for almost all countries from 1960 until 2011, other databases may have considerably less coverage. For example, while macroeconomic data from the Conference Board and AMECO cover 1960 to 2013, OECD data are available from 1990 to 2011, and Eurostat data on employment rates cover 1992 to 2011. Eurofound data on bargained wages cover 1998 to 2012. Similarly, some institutional variables of the economic policy regimes are available only from the late 1990s.

2 Deriving empirical hypotheses on bargaining regimes and pay outcomes

Bargaining level

Research background

According to the central predictions of Calmfors and Driffill (1988), industry-level wage bargaining would result in lower employment and greater macroeconomic growth than highly centralised or decentralised bargaining because of the two different mechanisms.

- At decentralised firm-level wage bargaining, highly elastic demand functions for the firms' product would limit its options to increase product prices if wages were increasing above the level of productivity. Firms faced with wages exceeding productivity would have to reduce employment levels and market share as prices could not be rolled over to goods markets. As a consequence, the likely bargaining outcome would accept moderate wage growth to retain employment levels.
- At higher levels of bargaining, such as sector level, the demand function on goods markets is less elastic than for individual firms. In the extreme case of monopoly unions, bargaining at the level of the macroeconomy, social partners could achieve nominal wage increases well above the achieved growth of output. This would not, however, result in a demand increase because the firms would immediately face higher production costs. Prices would have to increase as much as required for firms to remain operational, and long-term real wage growth would be only moderate. As social partners would anticipate such an outcome, wage bargaining would be moderated at the outset to allow wages to grow in line with true increases in output.

Hypothesis

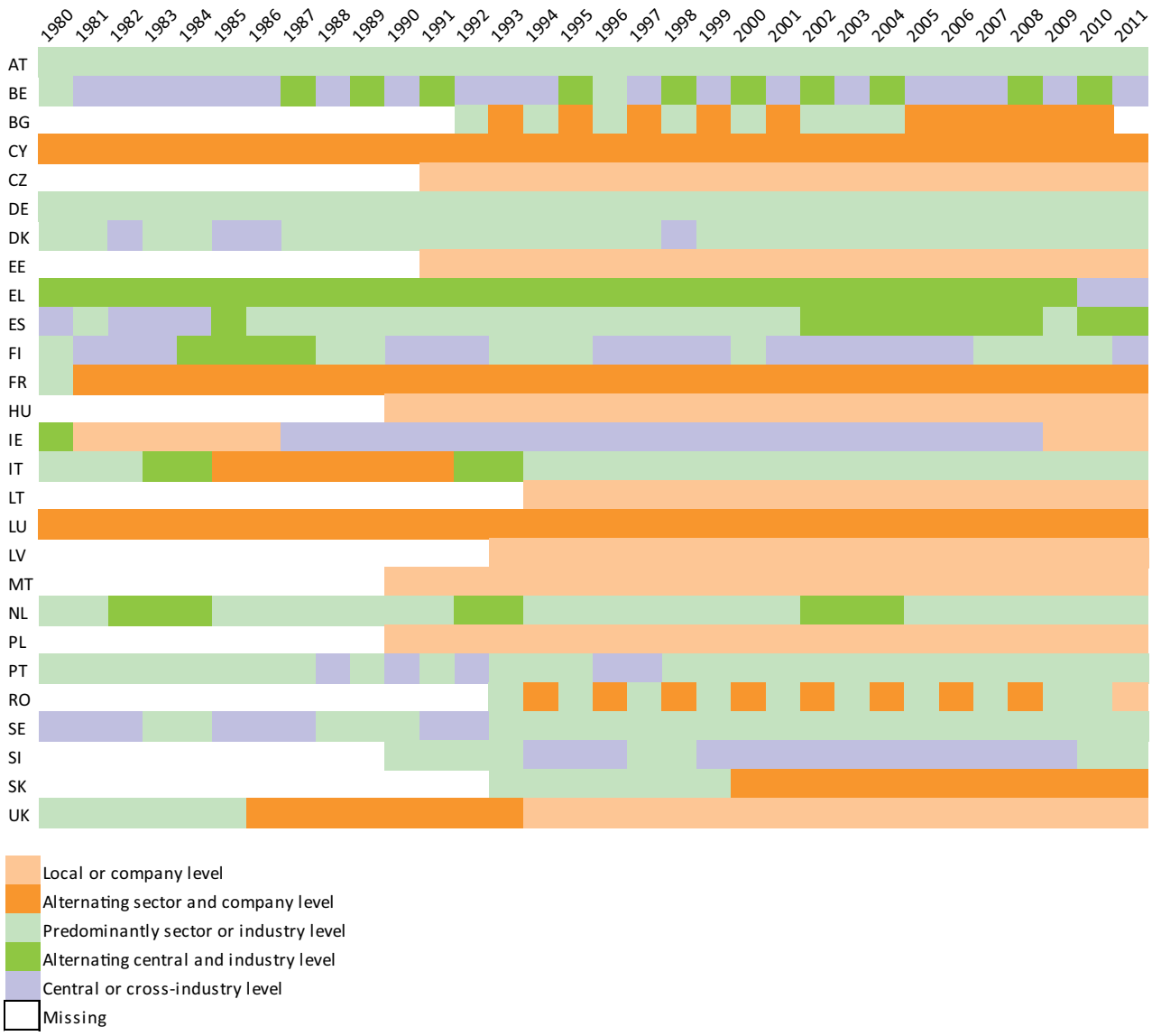
Highly centralised and highly decentralised bargaining regimes achieve wage growth in line with the growth of productivity, following key predictions of the Calmfors and Driffill model.

Description of the relationship

Degree of centralisation of wage bargaining is one of the institutional characteristics available for all countries included in the ICTWSS 4.0 database. This variable is used in Figure 3 to describe the predominant level at which wage bargaining takes place for a panel dataset of 27 Member States from 1998 to 2012.

Wage-bargaining regimes are classified according to five levels of centralisation. A level is considered as predominant if it accounts for at least two-thirds of the total bargaining coverage rate in a given year and country. In highly centralised regimes, such as those of Ireland until 2009 and Finland for much of the period, wage negotiation predominantly takes place at central or cross-industry level and is characterised by centrally determined binding norms or ceilings negotiated at a lower level. In contrast, bargaining in highly decentralised systems, such as that of the UK since the early 1990s and those of most eastern European countries, takes place at local or company level. Between these two ends of the spectrum there are a number of intermediate situations. In Austria, Denmark, Germany, Italy, the Netherlands, Portugal and Sweden, wage bargaining predominantly takes place at sector or industry level, while in others, such as that of Greece until 2009, it alternates between central and industry-level bargaining, or between sector and company negotiation (for example, the regimes of Cyprus, Luxembourg and France).

Figure 3: Predominant bargaining level

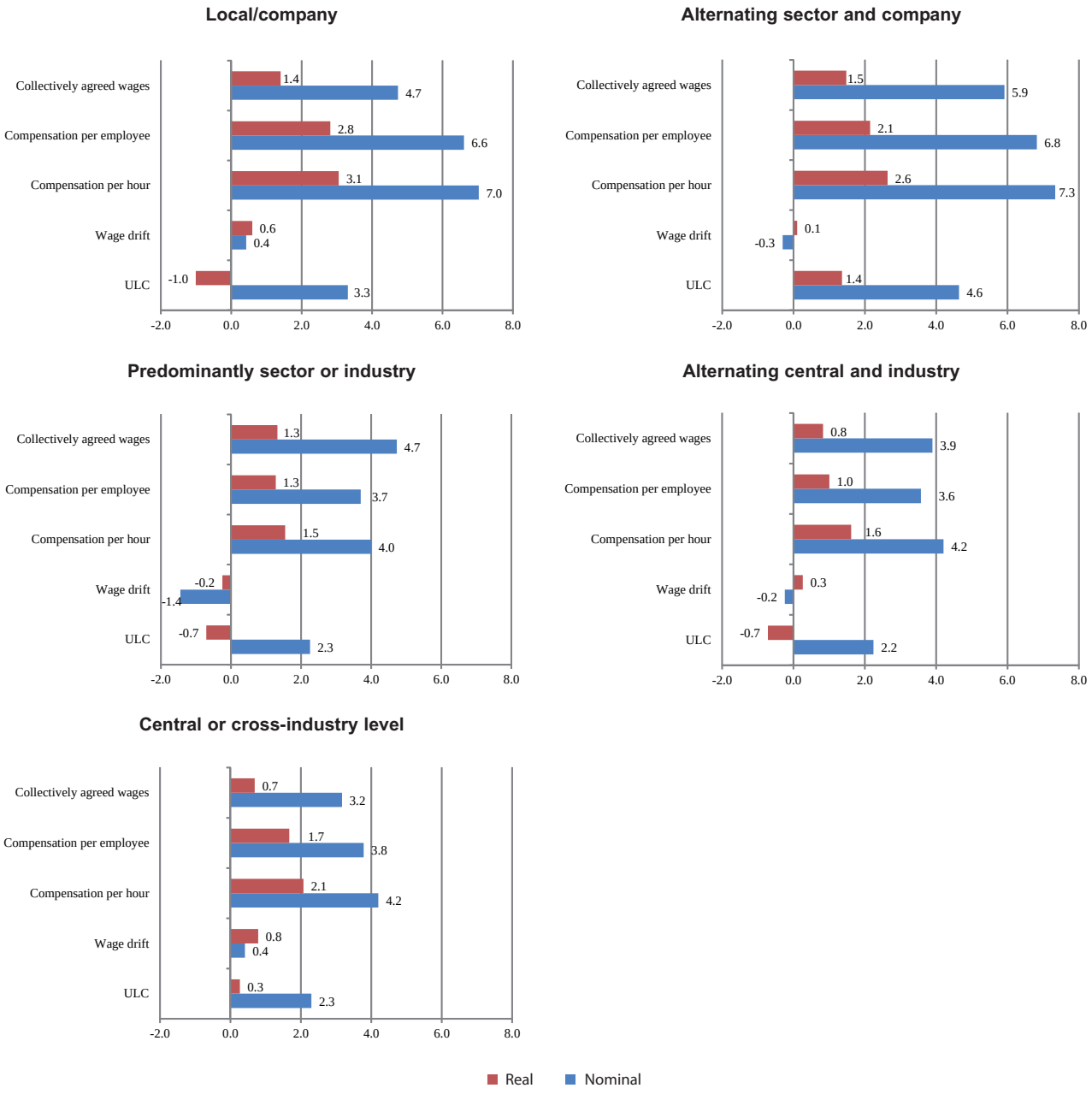


Source: *ICTWSS 4.0*

Collectively agreed wages, both in nominal and real terms, tend to grow faster in countries with highly decentralised and intermediate regimes than in highly centralised countries (see Figure 4). Average growth rates of pay outcomes, with the exception of real compensation, were highest in regimes with alternating sector and company bargaining. Real compensation (both hourly and per employee) grew less in regimes with bargaining at predominantly sector or industry level and at alternating central and industry level than at the highest level of centralisation (cross-industry), but average growth rates of nominal and real wages and other nominal measures of pay outcomes indicate that the bargaining outcomes of these two regimes (predominantly sector or industry level and alternating central and industry level) were very similar.

There is little difference in the gap between the growth in nominal and real wages across different bargaining regimes. The gap is slightly lower in countries where the wage bargaining is highly centralised. However, the level of bargaining is not strongly associated with the ratio of nominal wage growth to real wage growth. It should be borne in mind that observed differences do not reflect a causal impact of bargaining regimes on pay outcomes.

Figure 4: Bargaining level and average growth of pay outcomes (1998–2012)



Note: Average annual growth rates
Sources: *ICTWSS 4.0, AMECO (compensation per employee and ULC), Eurofound (collectively agreed wages), Conference Board (compensation per hour)*

Coordination level

Research background

Du Caju et al (2008, p. 17) describe coordination as:

> *the extent to which wage negotiations are coordinated across the various wage bargaining levels/actors within an economy and thus the extent to which the external consequences of wage agreements on the whole economy are taken into account.*

They further distinguish between horizontal coordination (the synchronisation of players within the same level of bargaining) and vertical coordination (synchronisation across the different levels of bargaining) to achieve consensus on a joint macroeconomic strategy. Indeed, as they argue, 'coordination and centralisation of wage bargaining are different concepts and the relation between the two is not obvious' as 'coordination is still possible in an environment of decentralised wage bargaining if coordination institutions are present' (p. 17).

Hall (1994) discusses the example of Japan, where unions are company based, but because of the coordination of wage bargaining in a 'single spring offensive', employers use their 'dense networks of business associations and coordinate the negotiations' (p. 5). Similar to centralised wage bargaining, coordination sets up a mechanism to aim for bargaining outcomes that avoid macroeconomic imbalances creating inflationary pressure or unemployment for lower levels of formal wage bargaining (Hall, 1994; Soskice, 1990; Hall and Soskice, 2001). Following on from Hall (1994), coordination may indeed be the key mechanism to achieve positive wage settlements in the context of the EMU, which follows a strict target of price stability. Central bank independence and price stability would help fragmented unions to coordinate in moderating wage claims because the price-level effects from wage growth exceeding the growth of labour productivity would be restricted by monetary policy following a clear objective of price stability, so that employment levels would be negatively affected.

In some Member States affected by the crisis (such as Greece and Ireland), decentralised wage bargaining with an increasing level of coordination has become a key characteristic of the bargaining system following the intervention of the European Financial Stability Facility (EFSF), which was conditional on reforms, including reforms of the wage-bargaining systems, in order to improve competitiveness.[10] There is some evidence of an emerging bargaining regime combining decentralisation and bargaining in Europe, but the formation of this bargaining regime fundamentally differs from the Japanese case, which originated from close industry-specific collaboration affecting many further institutional variables.

Hypothesis

One would expect that highly coordinated wage bargaining is the key mechanism to achieve nominal wage growth exceeding real wage growth only moderately. Real wage growth would be expected to be close to labour productivity, so that high employment levels could be retained. In fact, one would expect that coordination would be more important than the level of union centralisation and bargaining.

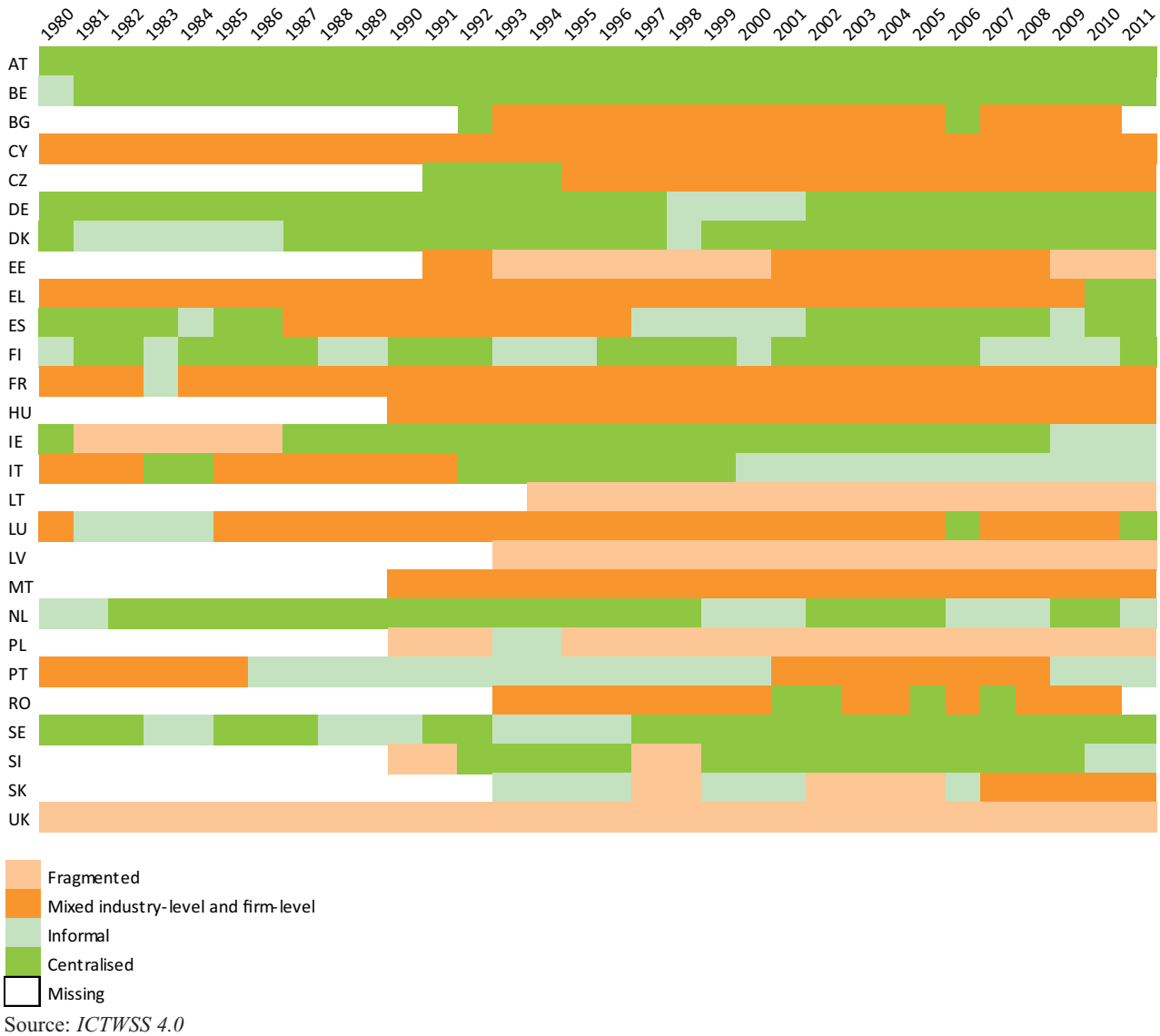
[10] Compared with the years before the euro zone crisis, Eurofound's EurWORK observatory shows higher levels of coordination and lower formal levels of bargaining in Ireland and Greece.
See **http://www.eurofound.europa.eu/observatories/eurwork/collective-wage-bargaining/context**.

Description of the relationship

The variable on coordination in ICTWSS 4.0, used in Figure 5, distinguishes between five levels of wage-setting coordination. In this analysis, the two levels referring to the most coordinated regimes were collapsed (see Figure A1 in Annex 1 for a detailed description of this variable). Highly coordinated regimes are characterised by strong government involvement in aspects of wage setting such as centralised bargaining by peak associations, with or without government involvement (including government imposition of a wage schedule or freeze), or informal centralisation of industry-level bargaining by a powerful and monopolistic union confederation (for example, Austria prior to 1983).

Wage setting is highly coordinated (or centralised) in Austria, Belgium, Denmark, Germany, Spain and Sweden. Coordination can also be relatively high even if it is not achieved through formal channels. In some countries, such as Italy since 2000, wage bargaining is characterised by informal coordination of industry-level and firm-level bargaining. Other regimes are characterised by mixed industry-level and firm-level bargaining, with relatively weak elements of government coordination (statutory minimum wage or wage indexation). This is the case in Bulgaria, Cyprus, the Czech Republic, France, Greece until 2010, Hungary, Luxembourg and Malta. The lowest level of coordination consists of fragmented wage bargaining, which is confined largely to individual firms or plants, as in Latvia, Lithuania and the UK.

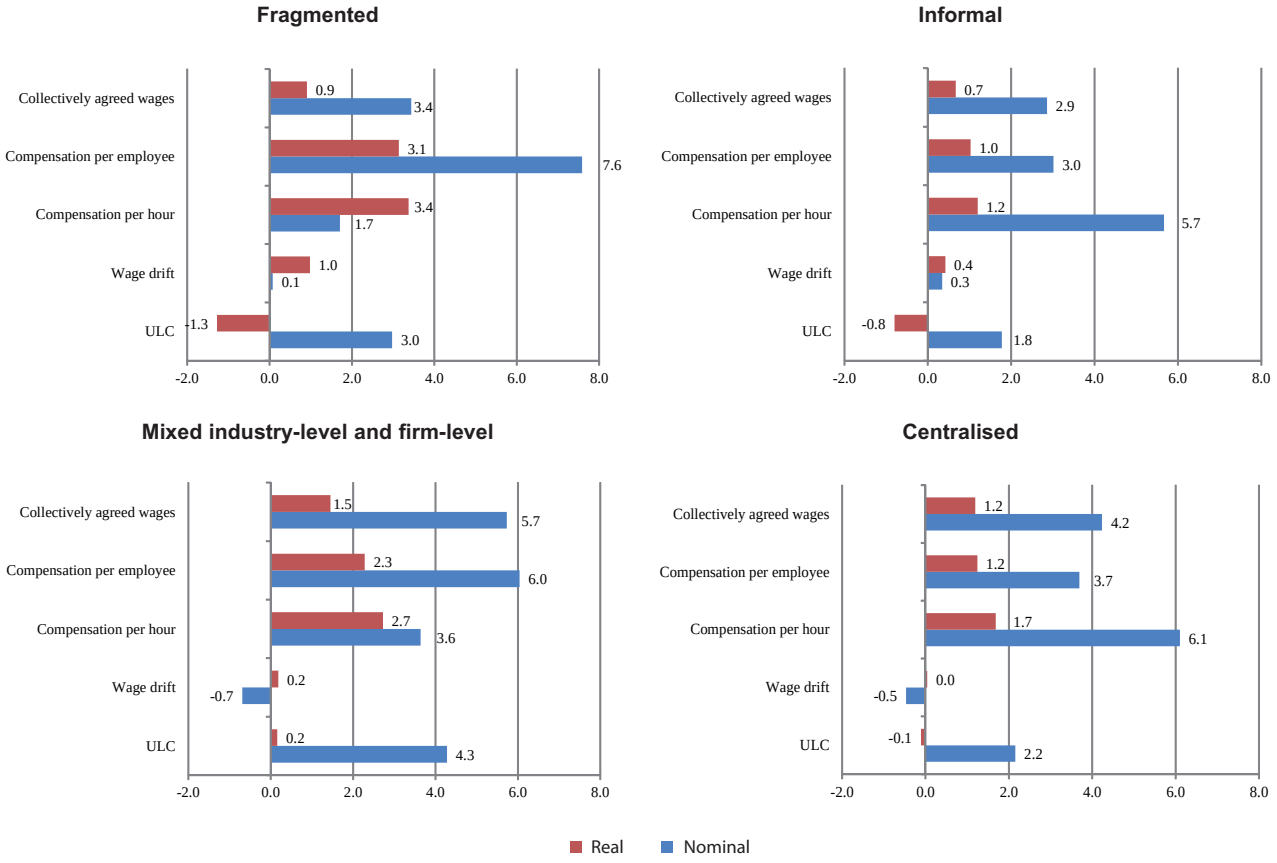
Figure 5: Coordination level of wage bargaining



Source: *ICTWSS 4.0*

Figure 6 shows the average growth rate of various pay outcomes (in nominal and real terms) by level of coordination. This figure suggests that relatively higher average growth rates of nominal and real wages and compensation per employee are related to regimes with fragmented and mixed industry-level and firm-level bargaining. With the exception of real wages, average growth rates of real pay outcomes are lower in regimes with centralised coordination compared with fragmented and mixed industry-level and firm-level bargaining. The difference between nominal and real growth rates of collectively agreed wages in highly coordinated regimes is not lower than in regimes characterised by fragmented wage bargaining. Descriptive statistics suggest no obvious association between the gap between nominal and real growth rates and the level of coordination.

Figure 6: Coordination level and average growth of pay outcomes (1998–2012)



Note: Average annual growth rates
Sources: *ICTWSS 4.0, AMECO (compensation per employee and ULC), Eurofound (collectively agreed wages), Conference Board (compensation per hour)*

Type of coordination

Research background

While coordination in early studies was related to a concept of high, medium and low coordination of wage bargaining, Traxler (2003) highlights the importance of the process of coordination for wage outcomes, macroeconomic stability and unemployment. As bargaining becomes increasingly flexible, for example as sector unions establish further agreements in the specific sectors they represent rather than at union level, intra- and inter-associational coordination become important institutional characteristics of bargaining regimes. In addition to voluntary coordination, government intervention can affect horizontal coordination, for example to coordinate cross-sector bargaining in the absence of

central-level agreement in order to achieve macroeconomic stability. Government intervention can also affect vertical coordination, for example to ensure compliance with bargaining outcomes across all levels of individual bargainers.

Traxler (2003, p. 199) distinguishes between five modes of coordinating wage bargaining based on 'behavioural patterns or activities' of the stakeholders involved (unions, employers and governments) in wage setting. The classification in the ICTWSS 4.0 database is very similar to that of Traxler, distinguishing particularly whether coordination results from government intervention. The following empirical typology is found in the data:

- uncoordinated bargaining;
- pattern bargaining;
- intra-associational ('informal centralisation');
- inter-associational by peak associations;
- state-sponsored bargaining (including pacts);
- state-imposed bargaining (including statutory controls in lieu of bargaining).

Hypothesis

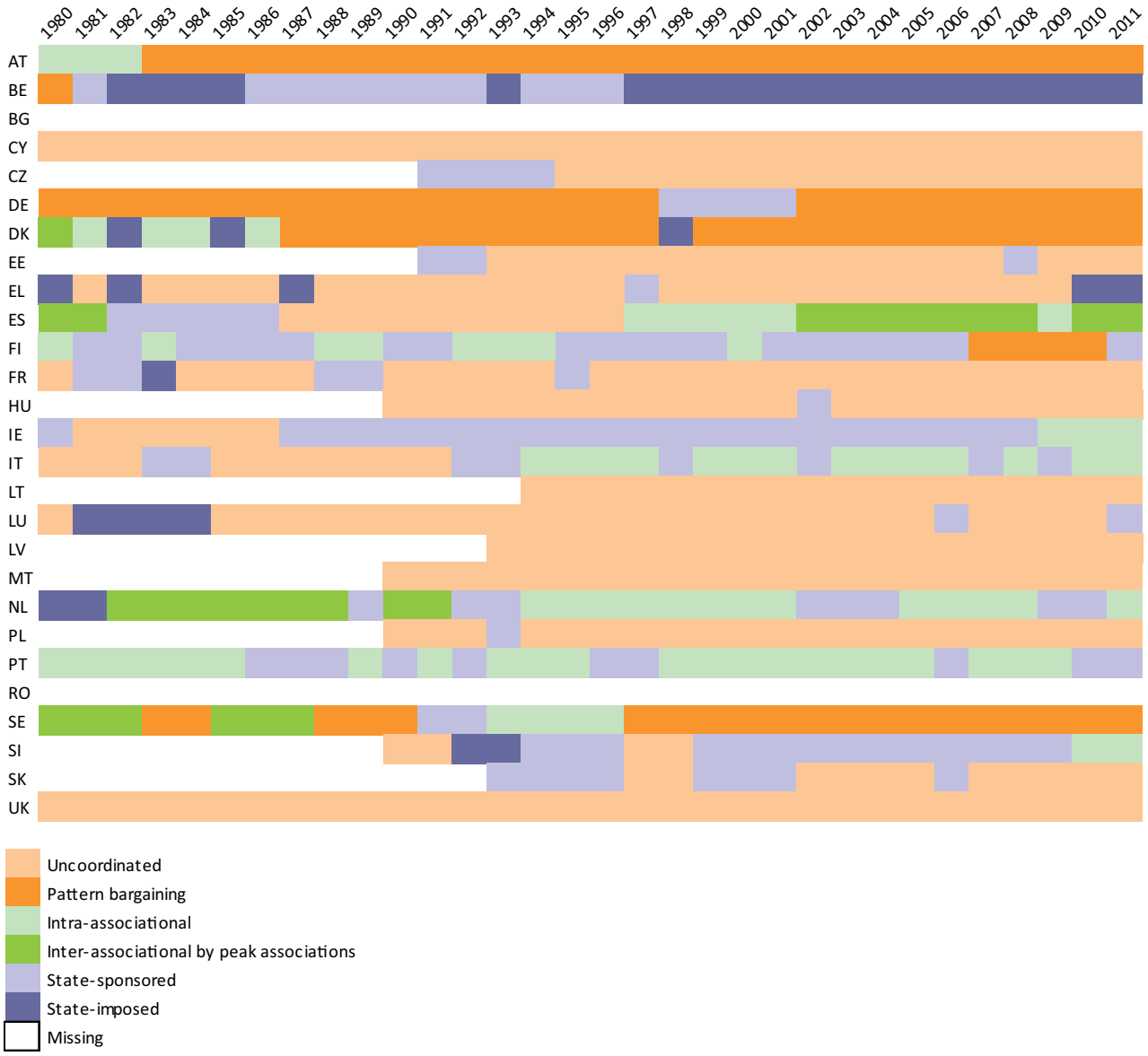
Theoretically, coordinated bargaining is likely to have a moderating effect on pay outcomes. Wages and labour compensation are likely to grow more in countries with uncoordinated bargaining.

The key mechanism for a moderating effect of coordination is similar to the argument regarding the level of coordination (above) that macroeconomic stability can be achieved through coordination even if bargaining takes place at lower formal levels. While government can explicitly engage in the process to achieve macroeconomic stability, coordination without government intervention can lead to the same outcome. As discussed in Soskice (1990), both high coordination by unions or employer associations, as in Japan, or pattern bargaining in pilot industries serving as a model for settlements in all industries, as in Germany, can achieve the same outcome of high coordination.

Description of the relationship

The empirical description of the type of coordination (Figure 7) shows that state-imposed bargaining has existed only in a few countries and at certain times. With the exception of Belgium, where a fixed role for the state in coordination exists in the national-level negotiations of two-year binding frameworks, the only other country with state-imposed bargaining is currently Greece, as a programme country. However, government has been recently or is at present involved in coordination in Estonia, Finland, Ireland, Italy, Luxembourg, the Netherlands and Slovenia, most of which traditionally have fragmented or inter-associational coordination. Countries without government intervention operate on the basis of pattern bargaining or inter-associational bargaining if coordinated. In addition, wage setting is completely uncoordinated in many countries, including most eastern European countries, Cyprus, Malta and the UK.

Figure 7: Type of coordination

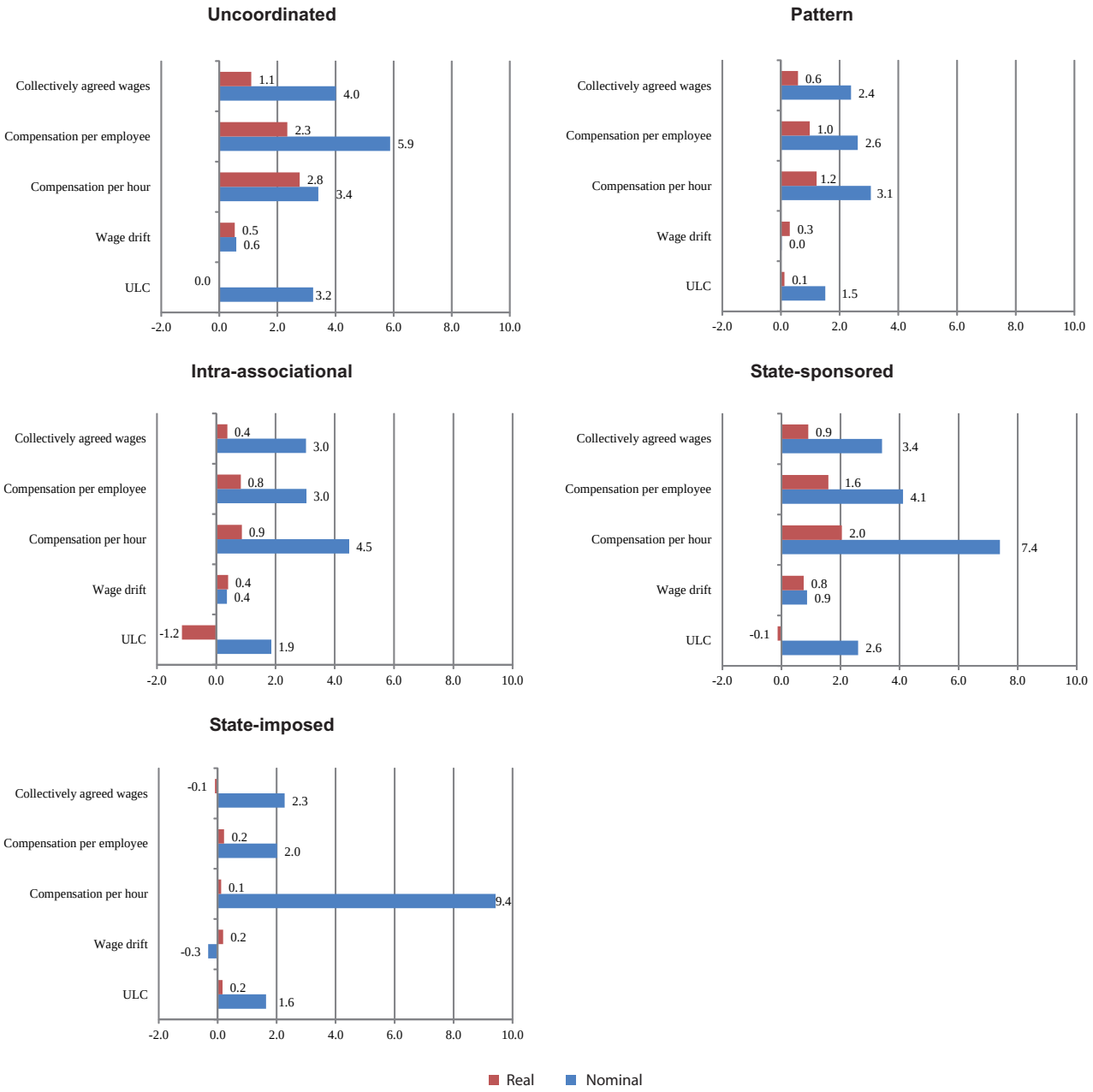


Source: *ICTWSS 4.0*

The results displayed in Figure 8 suggest that regimes with uncoordinated bargaining show, on average, higher growth rates of collectively agreed wages, both in nominal and real terms. In contrast, regimes with pattern bargaining and intra-associational bargaining show lower increases in collectively agreed wages and other compensation measures, except for nominal hourly compensation. State-sponsored bargaining is associated with nominal pay outcomes similar to regimes with intra-associational bargaining (except for hourly compensation), although real wages in state-sponsored bargaining regimes are higher. The lowest average growth rates of both nominal and real pay outcomes (again with the exception of hourly compensation) were found in countries with state-imposed bargaining, but the number of observations in this group is very low (N=17).

In relation to the gap between nominal and real wage growth, a wider gap was found for uncoordinated countries and countries where bargaining was state-sponsored compared with countries with voluntary coordination initiated by unions. Also noticeable is that real wage growth is lowest (even negative) when government imposes statutory control over wages.

Figure 8: Type of coordination and average growth of pay outcomes (1998–2012)



Notes: Average annual growth rates; intra-associational and inter-associational with peak associations have been combined in the chart labelled 'Intra-associational'.
Sources: *ICTWSS 4.0, AMECO (compensation per employee and ULC), Eurofound (collectively agreed wages), Conference Board (compensation per hour)*

Combinations of coordination and bargaining levels

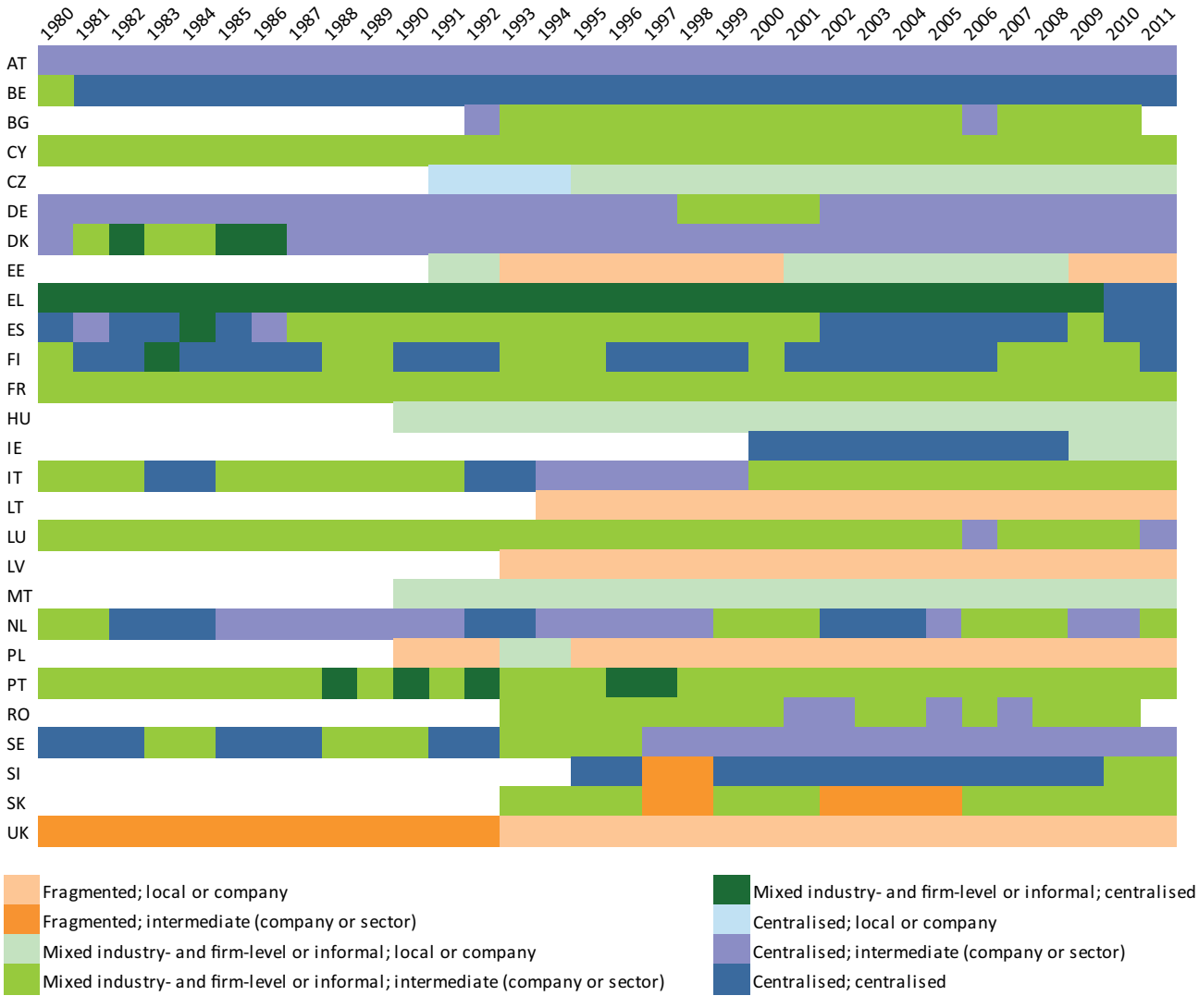
As in the previous Eurofound report (2014), the current study analyses pay outcomes in relation to a classification of national bargaining regime that combines the level of bargaining and the degree of coordination. As in the Eurofound report, such classification aims to include both the relevant institutions as suggested by Calmfors and Driffill (1988) and the subsequent extensions to coordination by Soskice (1990), Hall and Franzese (1998) and Iversen (1999).

The two-dimensional properties of the regimes described here aim to characterise the flexibility of the bargaining regimes (the level at which bargaining takes place and the flexibility to adjust) and the capacity to achieve moderate growth in pay outcomes in order to retain high employment levels and macroeconomic stability.

Interaction of coordination level and bargaining level

To characterise the wage-bargaining regime in more detail, the level of bargaining was combined first with the level of coordination (in the next section, it is combined with the type of coordination). Three levels of bargaining were defined: local or company; intermediate (company or sector); and centralised. Three levels of coordination were also defined: fragmented; mixed industry and firm level or informal; and centralised. These sets of classifications were combined to identify eight wage-bargaining regimes over the period of interest (no bargaining regime was characterised by fragmented coordination and a centralised level of bargaining). The rationale for this approach is that the bargaining level and coordination level are likely to affect wage-bargaining outcomes and are likely to interact. For instance, the impact of decentralised bargaining may depend on whether or not some coordination takes place at industry level. Figure 9 shows the different wage-bargaining regimes defined by an interaction of coordination and bargaining levels. Mixed industry-level and firm-level coordination with an intermediate bargaining level is the most common, followed by fragmented coordination and local or company-level bargaining.

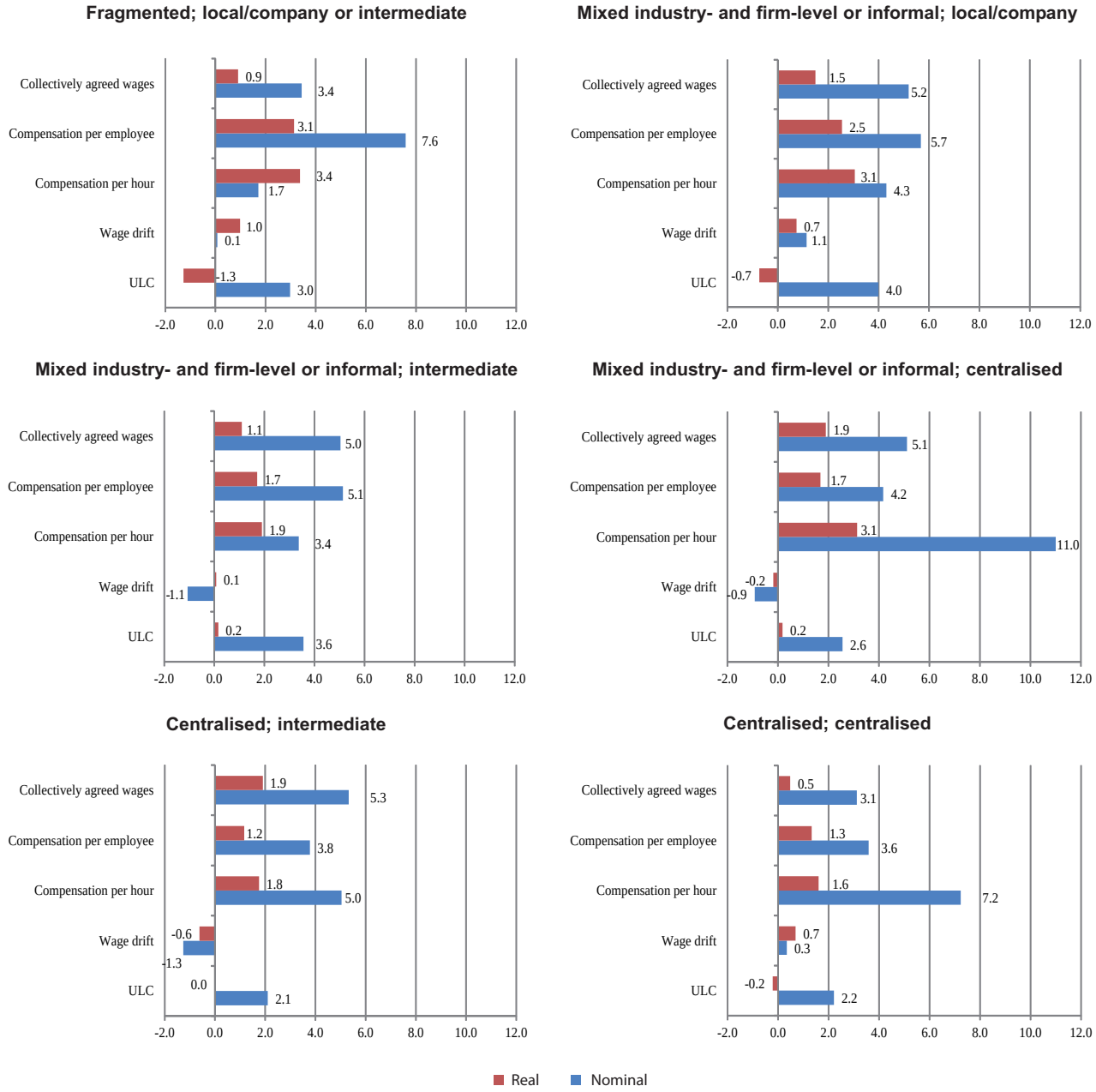
Figure 9: Coordination level combined with bargaining level



Source: *ICTWSS 4.0*

Figure 10 shows the average annual growth of a number of pay outcomes in different bargaining regimes characterised by bargaining level and coordination level. Growth in real compensation per employee and hourly compensation is highest in regimes with local/company-level or intermediate-level bargaining and fragmented coordination; it is lowest in bargaining regimes with centralised coordination. By contrast, growth of real collectively agreed wages is relatively low in regimes with local/company-level bargaining and fragmented coordination, resulting in large wage drift growth. This suggests that bonuses and in-kind payments are higher in this type of bargaining regime than in any other.

Figure 10: Coordination level combined with bargaining level and average growth of pay outcomes (1998–2012)

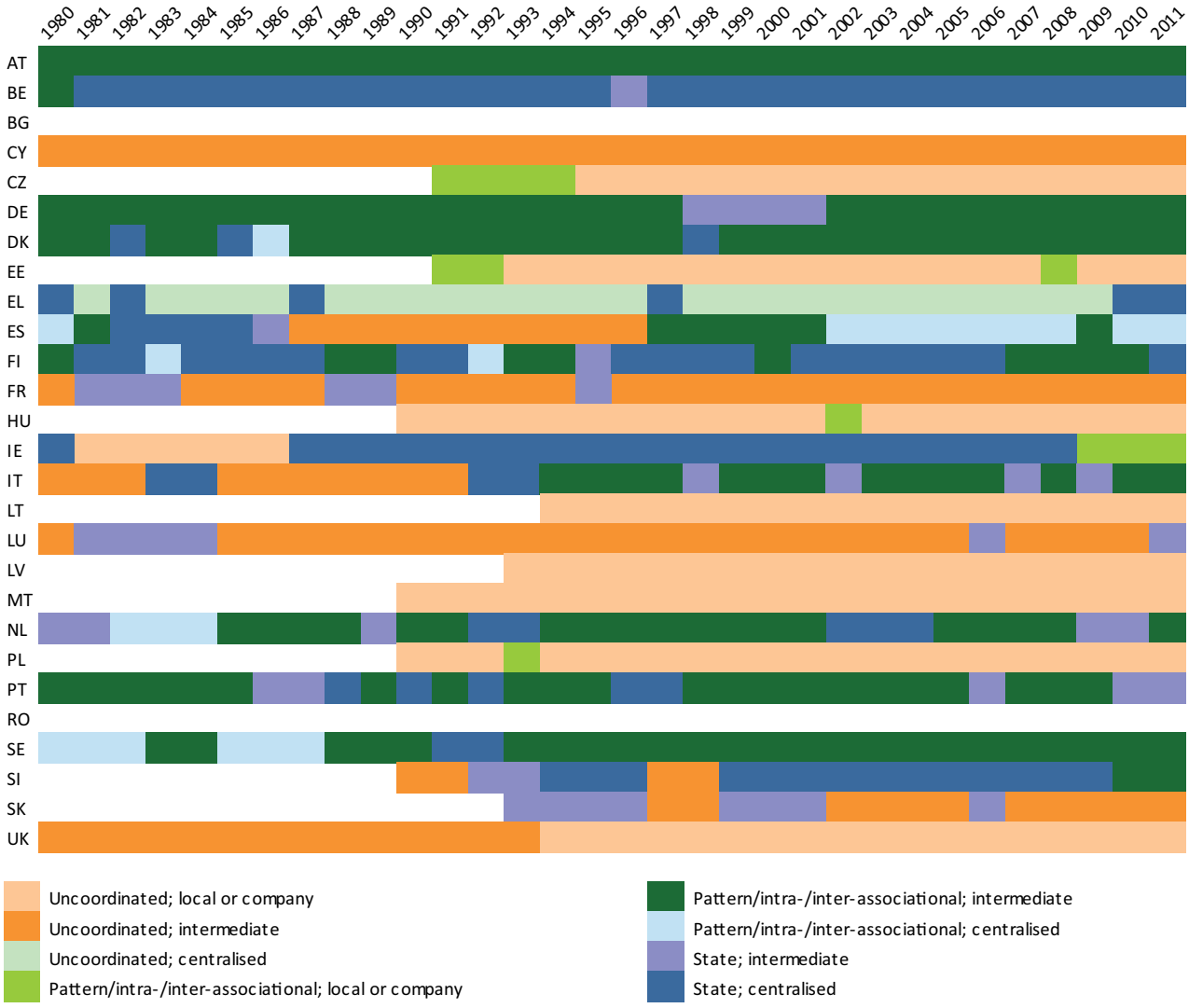


Notes: Average annual growth rates; categories have been combined due to the small number of observations.
Sources: *ICTWSS 4.0, AMECO (compensation per employee and ULC), Eurofound (collectively agreed wages), Conference Board (hourly compensation)*

Interaction of the type of coordination and bargaining level

Next, the level of bargaining is combined with the type of coordination. The same three levels of bargaining as in the previous section are used (local or company, intermediate (company or sector), and centralised) and three types of coordination have been defined: uncoordinated, pattern/intra-/inter-associational and state. Combining both classifications results in eight wage-bargaining regimes, as no regime is characterised by local/company-level bargaining and coordination by the state. Figure 11 shows that there is a reasonable amount of both cross-country and time variation. Between 1980 and 2011, wage-bargaining regimes so defined changed at least once in most EU countries.

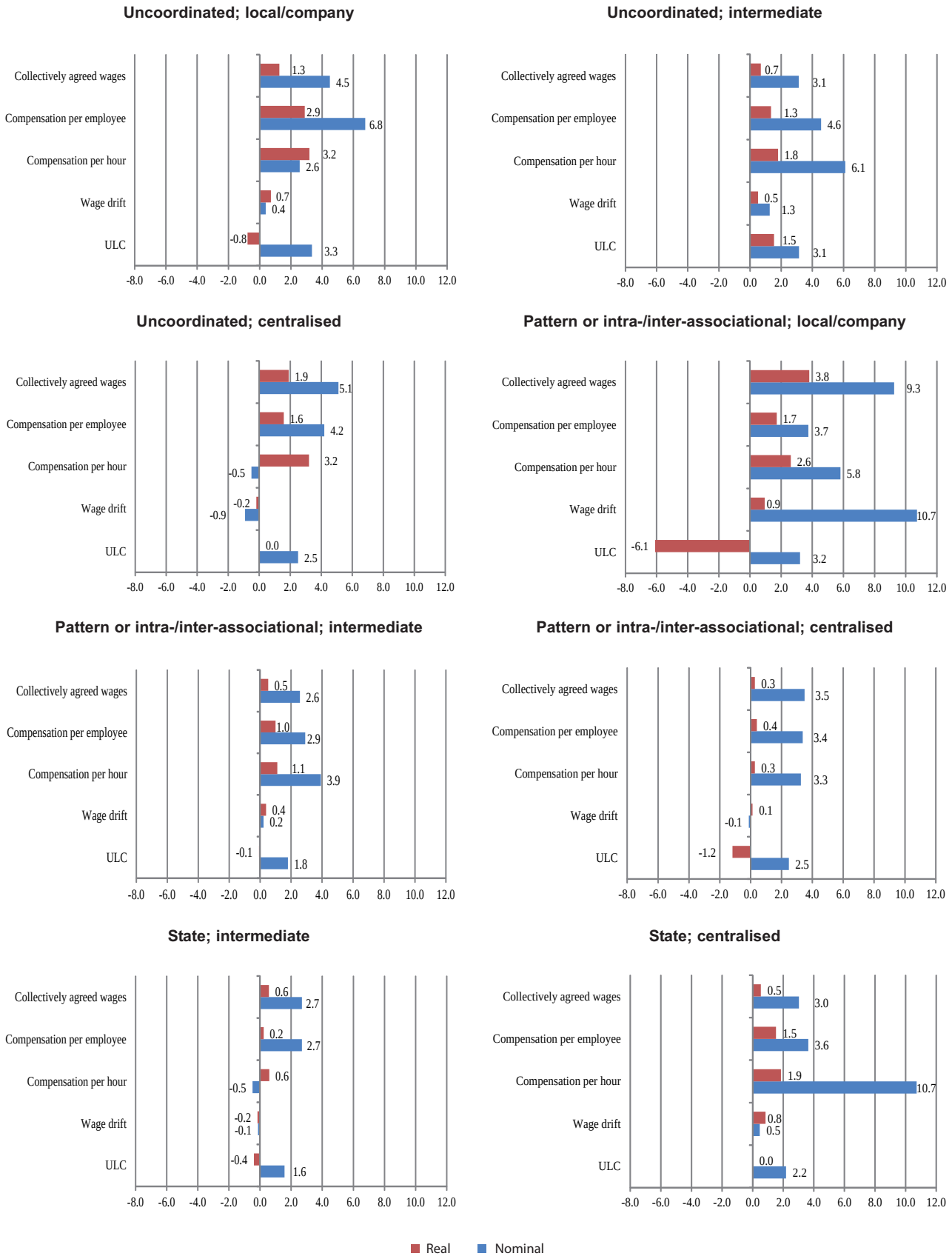
Figure 11: Type of coordination and bargaining level



Source: *ICTWSS 4.0*

Figure 12 shows that collectively agreed wages, compensation per employee and hourly compensation are higher both in nominal and real terms in uncoordinated regimes with local/company-level bargaining than in intermediate regimes in which coordination is achieved through pattern or intra-/inter-associational bargaining. In uncoordinated regimes, real pay outcomes tend to be lower if the bargaining takes place at company or sector level rather than at the company level only. Centralised bargaining with coordination by the government is associated with slightly higher pay outcomes than intermediate regimes in which coordination is achieved through pattern or intra-/inter-associational bargaining.

Figure 12: Type of coordination combined with bargaining level and average growth of pay outcomes (1998–2012)



Note: Average annual growth rates

Sources: *ICTWSS 4.0, AMECO (compensation per employee and ULC), Eurofound (collectively agreed wages), Conference Board (hourly compensation)*

Opening clauses

Research background

A previous Eurofound report (2010) analysed the inclusion of opening or derogation clauses in higher-level wage bargaining and their practical use at company level in seven countries. The evidence suggested that such clauses were implemented on a large scale only in Germany, although the mechanism existed traditionally in most countries. In its conclusion, this study stated that there was a shift in overall collective bargaining in Germany, which moved a 'large part of bargaining responsibilities to company level' (p. 11), while other countries retained their traditional system of bargaining at sector level.

The OECD (2010) reported, based on German evidence, that between 33% and 50% of all companies had made use of opening clauses. While many of them primarily included company-specific working-time regulations, the findings also suggested that:

> *an increasing proportion (about 16% in the most recent survey) is dealing with remuneration issues as well – e.g. two-tier wage regimes with reduced wages for job starters or cuts in holiday bonuses. A variant of opening clauses are the so-called 'company employment pacts' where pay cuts are exchanged for employment guarantees.*
>
> (OECD, 2010, p. 154)

Based on firm-level data for Germany, Brändle and Heinbach (2010) estimated that the use of opening clauses did indeed have positive effects on employment stability at the microeconomic level.

In recent years, the social partners in many countries also introduced opening clauses in national collective agreements, for example in Ireland, or central governments introduced opening clauses via legislation. In Greece, local territorial employment and wage pacts were introduced in 2010, explicitly allowing wage increases at firm level to remain below those set out in sectoral agreements. These pacts linked pay and wages explicitly to firm performance, which allowed downward flexibility from higher-level bargaining in order to achieve employment stability in the firms (see Eurofound, 2011a).

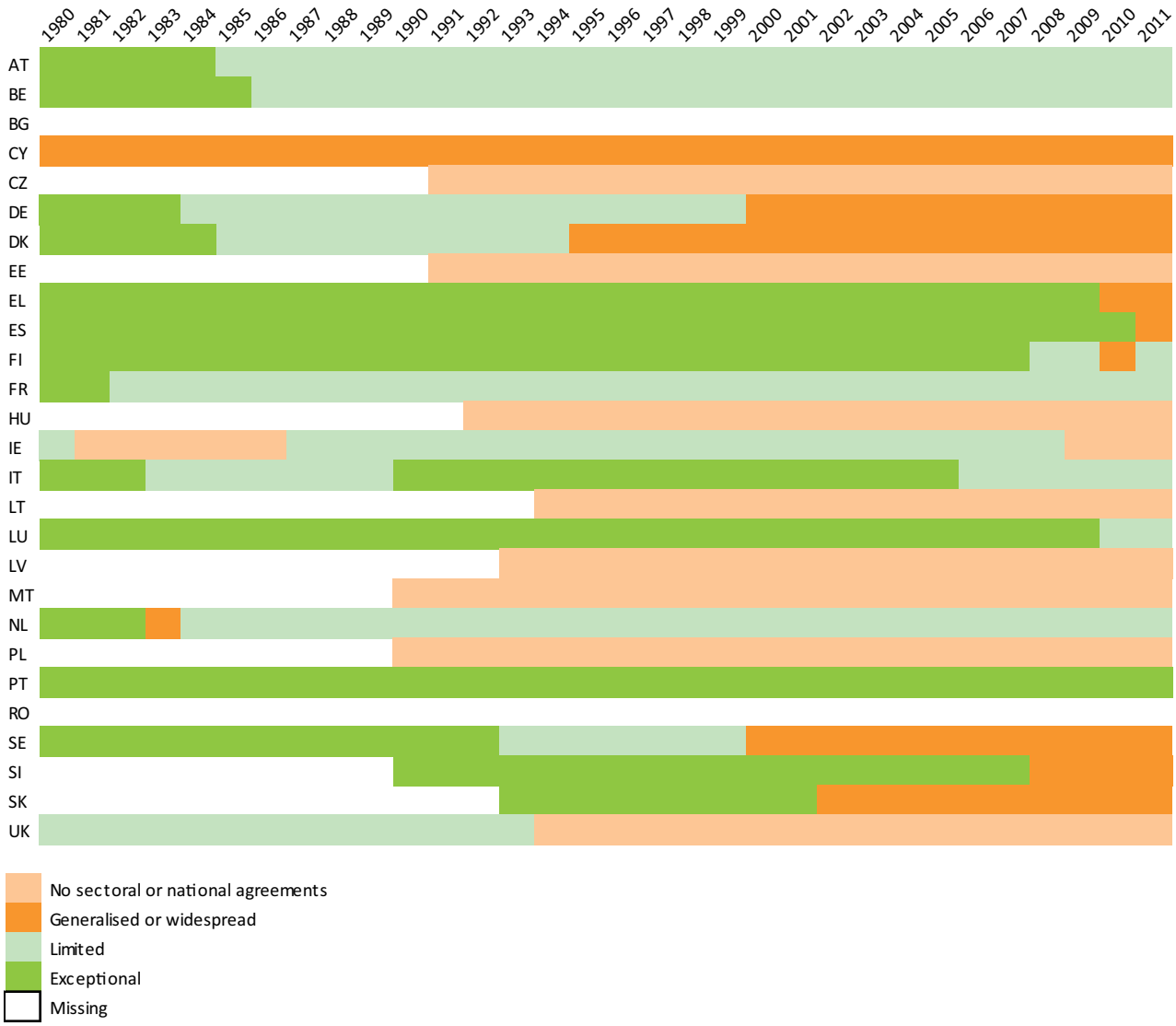
Hypothesis

The existence and more specifically the use of opening clauses would move wage bargaining more clearly towards decentralised systems of wage negotiations. Following the predictions of Calmfors and Driffill (1988), a decentralised system operating at company level would result in wage moderation, thus achieving nominal wage growth only moderately different from real wage growth.

Description of the relationship

In countries without sectoral or national agreements, opening clauses are irrelevant by definition because bargaining is fully decentralised. Using information provided in ICTWSS 4.0, three levels of use of opening clauses are evident in regimes that have sectoral or national agreements. In Portugal, opening clauses are still exceptional and only related to specific cases of bankruptcy or restructuring. In most other countries, the use of opening clauses, while exceptional in the early 1980s, has increased, although it is still limited. In some countries, opening clauses have become widespread, particularly in recent years. Most of these implement bargaining at sector level; in some, however, the sector agreement only defines a default in case local negotiations fail. In many countries, such as Denmark, Germany, Greece, Slovakia, Slovenia, Spain and Sweden, there is a shift towards a generalisation of opening clauses.

Figure 13: Use of opening clauses in wage bargaining



Source: *ICTWSS 4.0*

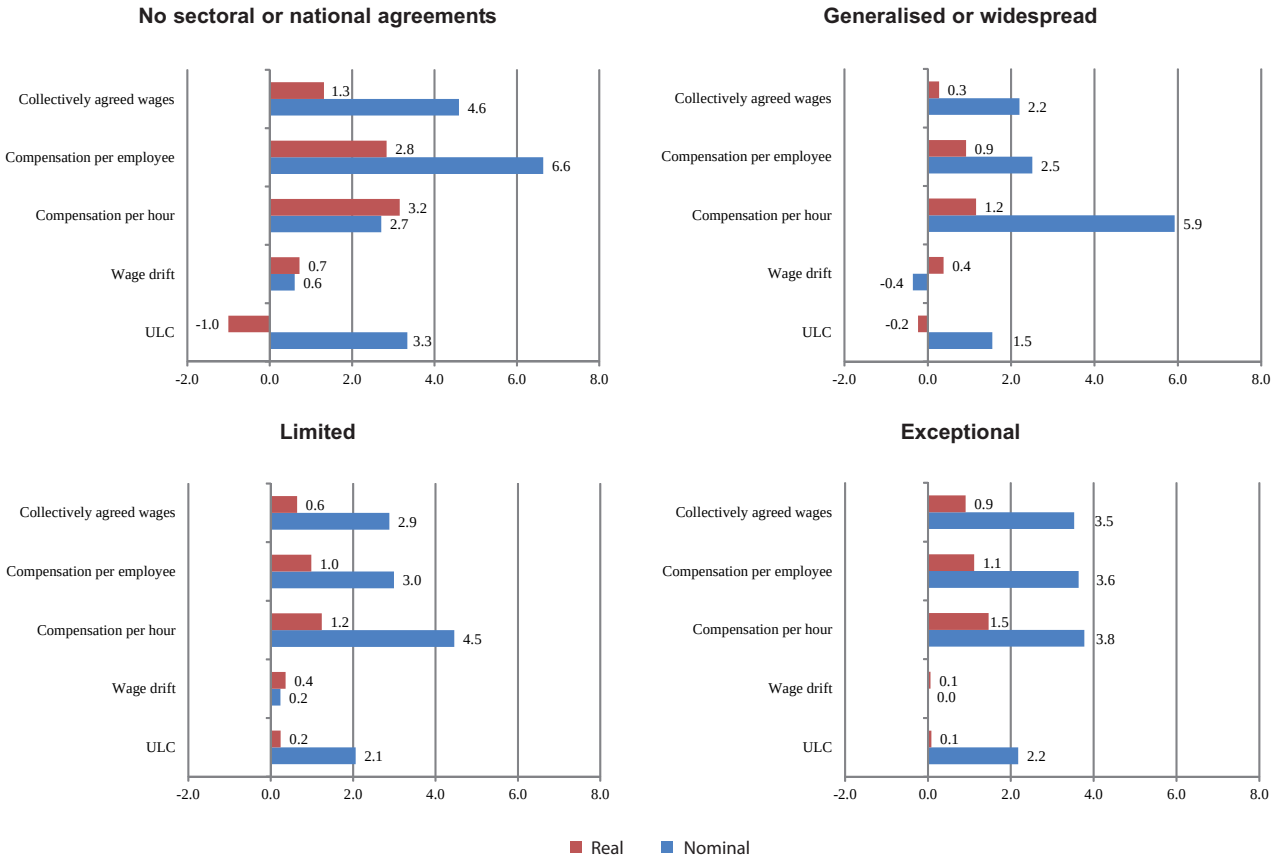
The descriptive analysis (Figure 14) indicates that pay outcomes increased most in countries without sectoral or national agreements, in other words, those where opening clauses do not exist.

Comparing countries with a generalised and widespread use of opening clauses and those with limited or exceptional use, the latter show higher average wage growth (both nominal and real) and higher growth of most other pay outcomes, with the exception of nominal hourly compensation. In those countries operating higher-level agreements, nominal ULC declined where there is widespread use of opening clauses, while in countries with limited or exceptional use, ULC increased. Countries without sectoral and national agreements and, hence, without opening clauses showed the highest growth of nominal ULC and the biggest decrease in real ULC.

In countries that have sectoral or national wage agreements, the difference between nominal and real wage growth rates is bigger where the use of opening clauses is restricted. While this seems to suggest that the use of opening clauses is likely to result in wage moderation, it was also found that the growth of real ULC was lowest in countries without sector

or national agreements. As with the findings presented in Figures 4 and 6 above, this suggests that real ULC grows faster in regimes where wage bargaining takes place above company level, as in regimes making some use of opening clauses.

Figure 14: Use of opening clauses and average growth of pay outcomes (1998–2012)



Note: Average annual growth rates
Sources: *ICTWSS 4.0, AMECO (compensation per employee and ULC), Eurofound (collectively agreed wages), Conference Board (hourly compensation)*

Wage pacts

Research background

In addition to the coordination of wage bargaining, wage pacts (also known as social pacts) are an important mechanism aiming to achieve macroeconomic stability and moderate wage growth. In many Member States, these pacts between unions, employer associations and national government influence the level of bargaining, for example by extending the use of opening clauses, as in the German Alliance for Jobs, Training and Competitiveness (Bündnis für Arbeit, Ausbildung und Wettbewerbsfähigkeit) from 1998. They also influence pay outcomes, for example when unions and employer associations commit to wage increases below the level of productivity in order to increase employment outcomes (Arlt and Nehls, 1999). While pacts might have regained importance in many countries affected by mass unemployment during the economic crisis, they have a long history, dating back to the Concerted Action (Konzertierte Aktion) of the late 1960s in Germany, or the Wassenaar Agreement of the early 1980s (Hemerijck et al, 2000), which consisted of a long-term agreement between unions and employers in the Netherlands to restrain wage growth in order to achieve low unemployment rates and inflation.

Hancké and Rhodes (2005) argue that the emergence of social pacts is related to pre-existing institutional arrangements in wage bargaining and also to external pressures. Wage pacts were particularly associated with the preparation for EMU, which affected economic policy regimes more generally, and followed on similar arrangements in small, open western European economies before EMU. In fact, Hancké and Rhodes argue that the smaller economies (Austria, Belgium and the Netherlands, in particular) had to set up wage pacts to achieve 'wage-setting systems to accommodate low inflation' (p. 10) to achieve the inflation target set by the Bundesbank from the 1980s. If countries did not operate similar mechanisms and allowed wages to rise above the growth of productivity, they faced large social costs in terms of unemployment (as in France in the 1980s).

While pacts emerged in many European countries, Hancké and Rhodes argue that their impact on wage bargaining ultimately depends on the micro foundations of the labour market.

- In traditionally negotiating economies, wage moderation and consensus were embedded or could be achieved via state-sanctioned bargaining extensions, as in France.
- Social pacts in countries that traditionally accepted high inflation and deficits would be less effective instruments to achieve wage moderation.

Hypothesis

The existence of a wage pact would restrict or moderate increases in nominal wages to follow an exogenous inflation target.

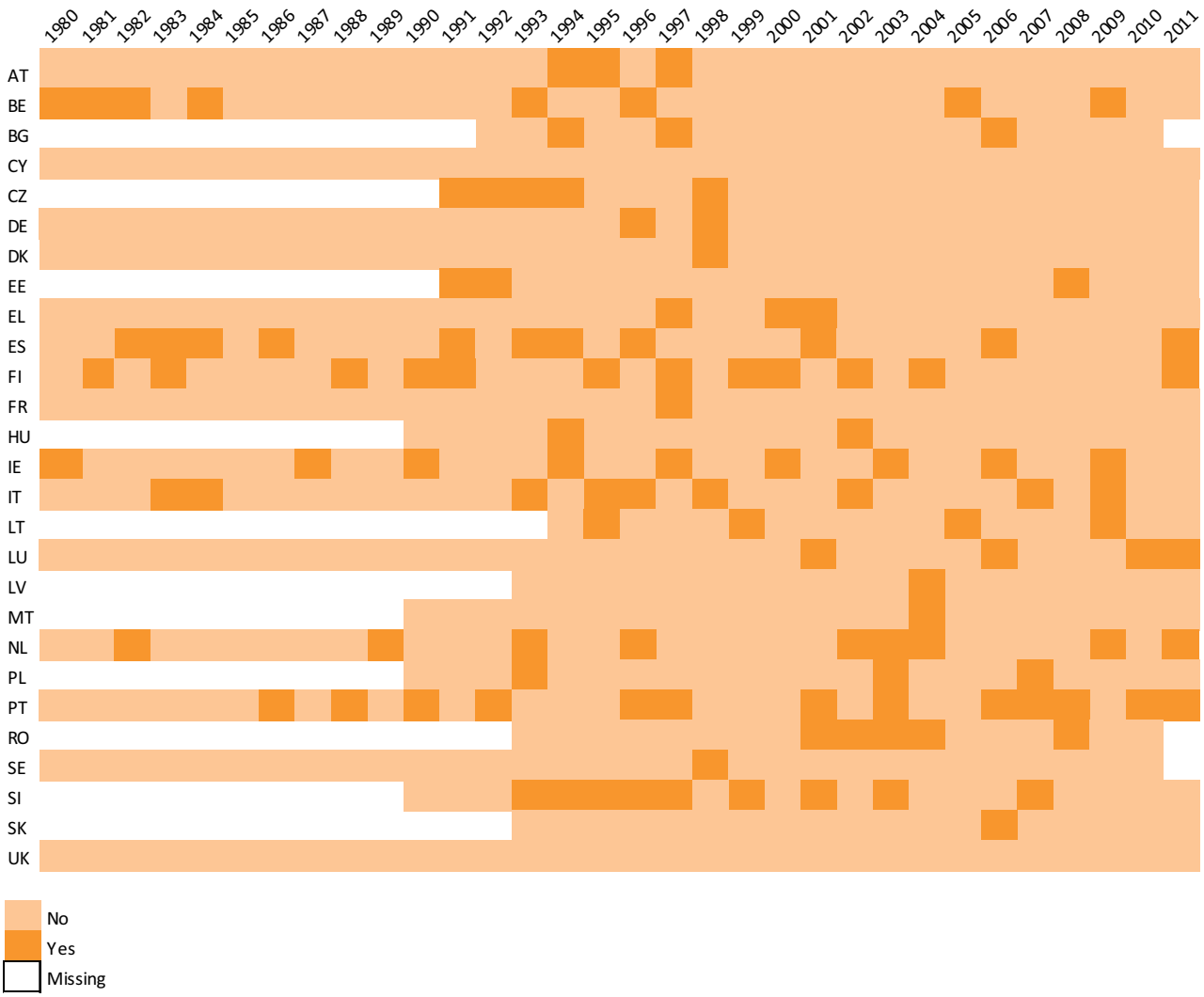
A pact would avoid macroeconomic imbalances such as real wage growth lagging greatly behind nominal wage growth; however, its effectiveness depends on the 'economic and social policy regime' and the degree of corporatism generally present in the economy.

Description of the relationship

ICTWSS 4.0 contains information about whether a social pact is (publicly) proposed by the government, the unions or the employers, and negotiations take place in the specified year.[11] This variable is used rather than an alternative ICTWSS variable on a tripartite or a government–union social pact being reached and signed, as signing and implementing wage bargaining structured by such a pact is likely to affect pay outcomes only in later years. Based on Figure 15, which shows the country–year data points according to whether or not a social pact was proposed, it is clear that in all countries, social pacts are proposed by the government, the unions or the employers only as a temporary measure.

[11] This is the ICTWSS 4.0 PactNeg variable, the widest possible concept of pacts in the database; the terms 'wage pact' and 'social pact' are used interchangeably in this report.

Figure 15: Proposal of social pacts

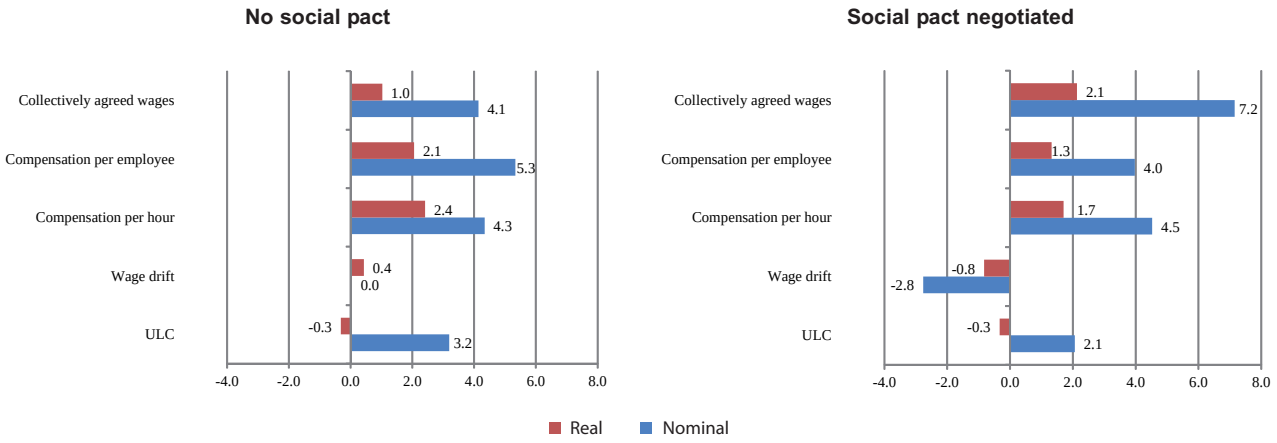


Source: *ICTWSS 4.0*

When looking at average pay outcomes in relation to a proposed wage pact, there are some surprising findings (Figure 16). In fact, average growth rates of nominal wages were much higher in countries with a proposed pact than those without. Similarly, real wages grew faster in countries with a pact. However, the description of growth rates of most other pay outcomes (with the exception of hourly compensation per employee) all suggest that pacts have a moderating effect on wages as these pay outcomes grew less than in countries without a pact.

When looking at the difference between nominal and real wage growth, it was found that the gap was wider in countries where a social pact was negotiated than in countries with no social pact. Similarly, the gap between nominal and real growth in hourly compensation was larger in countries where a social pact was negotiated than in countries without one.

Figure 16: Proposal of social pacts and average growth of pay outcomes (1998–2012)



Note: Average annual growth rates
Sources: *ICTWSS 4.0, AMECO (compensation per employee and ULC), Eurofound (collectively agreed wages), Conference Board (hourly compensation)*

Extension and derogation by government

Research background

Extension clauses by the government (or their functional equivalents, such as compulsory membership of an employer organisation)[12] play an important role in countries with multi-employer bargaining (see Eurofound, 2010 for a description of seven countries). Until recently, regulation usually extended agreements to cover workers not initially included in the bargaining agreement in countries with intersectoral (Belgium and Ireland) and sectoral wage bargaining (Austria, France, Germany, Spain and parts of Belgium). Based on such government intervention, some Member States achieve high collective bargaining coverage levels (Eurofound, 2010, p. 2), particularly in southern Member States, although union membership is comparatively low. In Germany and Italy, the extension of collective bargaining outcomes establishes sectoral minimum wages in the absence of a statutory minimum wage level, while extension clauses in countries with an existing statutory minimum wage (France, Belgium, Spain and Ireland) define an additional wage floor.

Usually, government intervention is foreseen only if extensions are in favour of the employees in terms of pay levels or terms compared to outcomes of sectoral and national-level wage bargaining (see Eurofound, 2010). While downward flexibility of wages and standards at the level of individual firms are also observed, such deviation mostly results from opening clauses within the sector agreements, as already mentioned. However, in the context of the recent recession, regulatory changes introduced more options to depart legally from sectoral and national minimum wages, which in many cases introduced derogation clauses.

- In France, the 2004 Fillion Law allowed that lower-level agreements could deviate from higher-level agreements and include changes for the worse ‘unless such derogation is expressly forbidden in the higher level agreement’ (Keune, 2011, p. 88).

[12] As a consequence of such equivalent mechanisms, full coverage of collective bargaining can also be achieved without direct extension by government. An example of such a mechanism is the Austrian Federal Economic Chamber (Wirtschaftskammer Österreich) representing the employers in all wage bargaining at the sector level.

- In Ireland, derogation clauses can also introduce a wage floor below the national minimum wage due to an 'inability-to-pay' clause, which exempts companies in financial difficulties from the national minimum wage for up to 12 months, subject to the labour courts' approval (Keune, 2011, p. 88).
- As with the opening clauses introduced in the 1990s in Germany, the Royal Law Decree 10/2010 in Spain explicitly enables company-level negotiations in order to retain employment levels or to avoid a firm going bankrupt.

Eurofound (2010) found that wages were hardly affected by derogation clauses in countries except in Germany and Spain. In a more recent study, Keune (2011) argued that the use of opening clauses in Germany led to increasing decentralisation of wage bargaining, lack of organisation of sector agreements and decline in coverage rate (p. 87).

Hypothesis

The impact of extension clauses is theoretically unclear.

Similar to statutory minimum wages, extension clauses establish binding minimum pay levels. By preventing pay outside collective agreements from being set unsustainably low, particularly in low-pay sectors, extension clauses would unidirectionally increase pay levels relative to fully flexible bargaining.

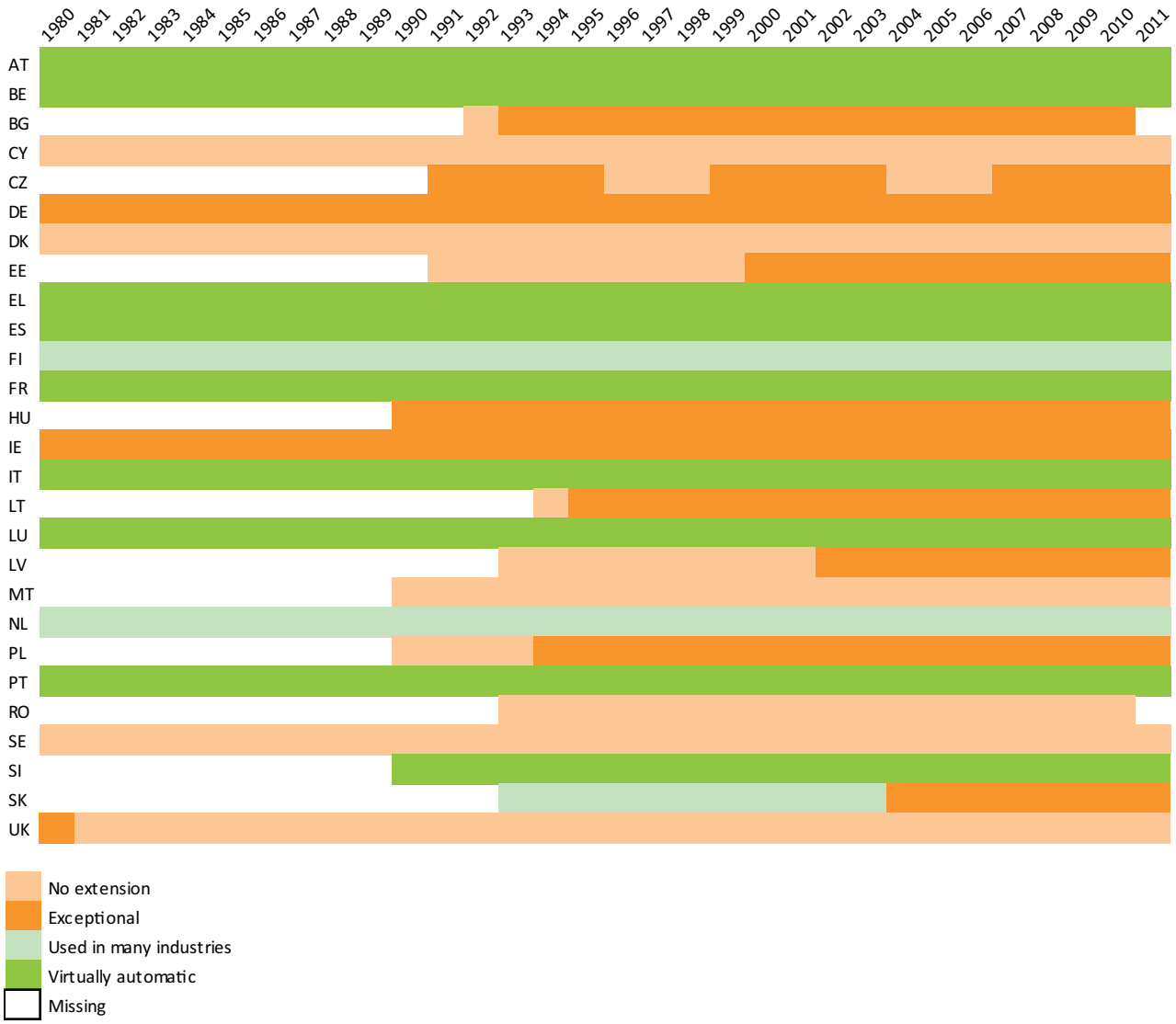
Alternatively, an extension beyond the increase of real labour productivity would be counterproductive in retaining employment levels and, therefore, would not be undertaken by the government. This suggests that extension mechanisms affect only countries with moderate bargaining outcomes, hence the institutional mechanism may itself be the outcome of the wage outcomes.

Description of the relationship

ICTWSS 4.0 provides information about the mandatory extension of collective agreements, under public law, to non-organised companies, summarised in Figure 17. The categorical variable distinguishes four levels of extensions for collective agreements:

- extension is automatic and general due to legal mechanisms or because of the existence of functional equivalents, such as compulsory membership of employer associations (Austria, Belgium, France, Greece, Italy, Luxembourg, Portugal, Slovenia and Spain);
- extension is used in many industries, but ministers can decide not to extend collective agreements (Finland, the Netherlands and Slovakia until the early 2000s);
- extension is exceptional, used only in some industries to compensate for the absence of sectoral agreements (the Baltic states, Germany, Hungary, Ireland, Poland and Slovakia);
- legal provisions for mandatory extension or a functional equivalent do not exist (Cyprus, Denmark, Malta, Romania, Sweden and the UK).

Figure 17: Extension of collective agreements



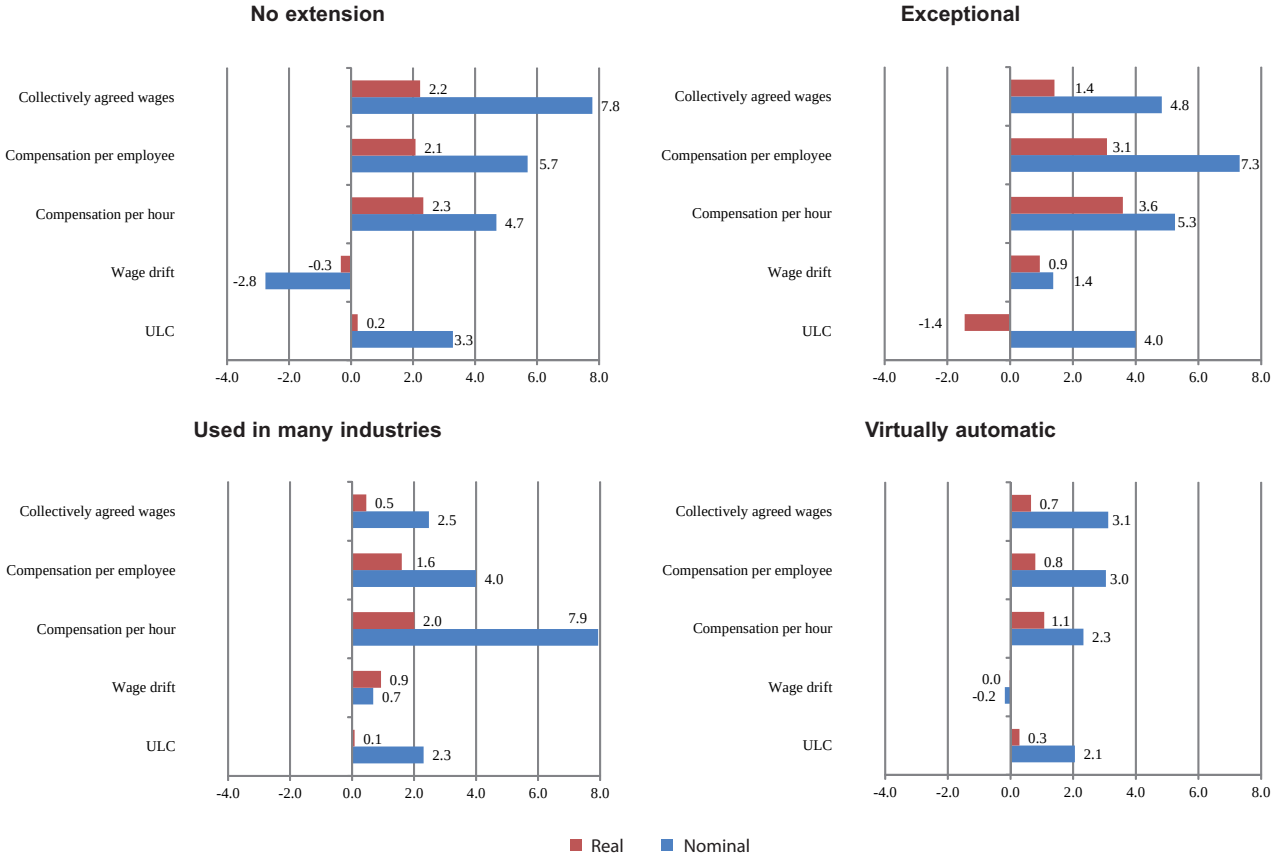
Source: *ICTWSS 4.0*

As can be seen in Figure 18, average growth rates of collectively agreed wages, both nominal and real, were higher in countries without extension or where extension was exceptional. Growth rates were smallest where bargaining outcomes were used in many industries or extended more or less automatically. This suggests that extensions are unlikely to establish a higher wage floor than counterfactual non-extension and are implemented in regimes that achieve moderate pay outcomes. The difference between the nominal and real wage growth rate stands at 5.6 percentage points in countries where there are no extension clauses, compared to 2.5 percentage points in bargaining regimes characterised by automatic and general extension.

Bargaining regimes in which extension clauses are used in many industries are associated with the lowest difference between nominal and real wage growth. In countries without extension, nominal wage growth is much higher than growth in nominal compensation (per employee or per hour), while average real growth rates are very similar. In contrast, average growth rates of nominal and real compensation are higher than growth rates of wages in all other

regimes. This, too, suggests that the extension of collectively agreed wages establishes a minimum growth rate, which is exceeded in other measures of pay outcomes. In contrast, pay outcomes in regimes without extension show much more similar growth; in other words, bargaining achieves wage growth, which then corresponds much more clearly to the growth of all other compensation measures.

Figure 18: Extension of collective agreements and average growth of pay outcomes (1998–2012)



Note: Average annual growth rates
Sources: *ICTWSS 4.0, AMECO (compensation per employee and ULC), Eurofound (collectively agreed wages), Conference Board (hourly compensation)*

Government participation in bargaining and tripartite councils

Research background

In all EU Member States, the state enables collective bargaining via the fundamental rights of the freedom of association to form unions and the autonomy of collective bargaining such that terms and conditions of employment can be negotiated between unions and employer associations. Government also facilitates bargaining through codified rights of unions to strike in order to impose collective bargaining.

In addition, many national governments directly participate in bargaining either by using their rights to monitor or control bargaining outcomes or by facilitating it, for example when participating in wage pacts. In addition, the introduction of the European Semester in the context of the Europe 2020 strategy introduced recommendations to national governments to introduce policy reform, including changes to the wage-setting framework, which introduced a new role for government policy in wage bargaining (Eurofound, 2014, p. 9).

Even though social partners have the right to autonomously set wages by collective agreements, state intervention via wage pacts is widespread. National governments, for example, restrict the growth of labour costs by setting targets for social partners in Belgium, Denmark, Finland, Germany, Italy, the Netherlands, Portugal and Sweden (Hassel, 2006, p. 179).

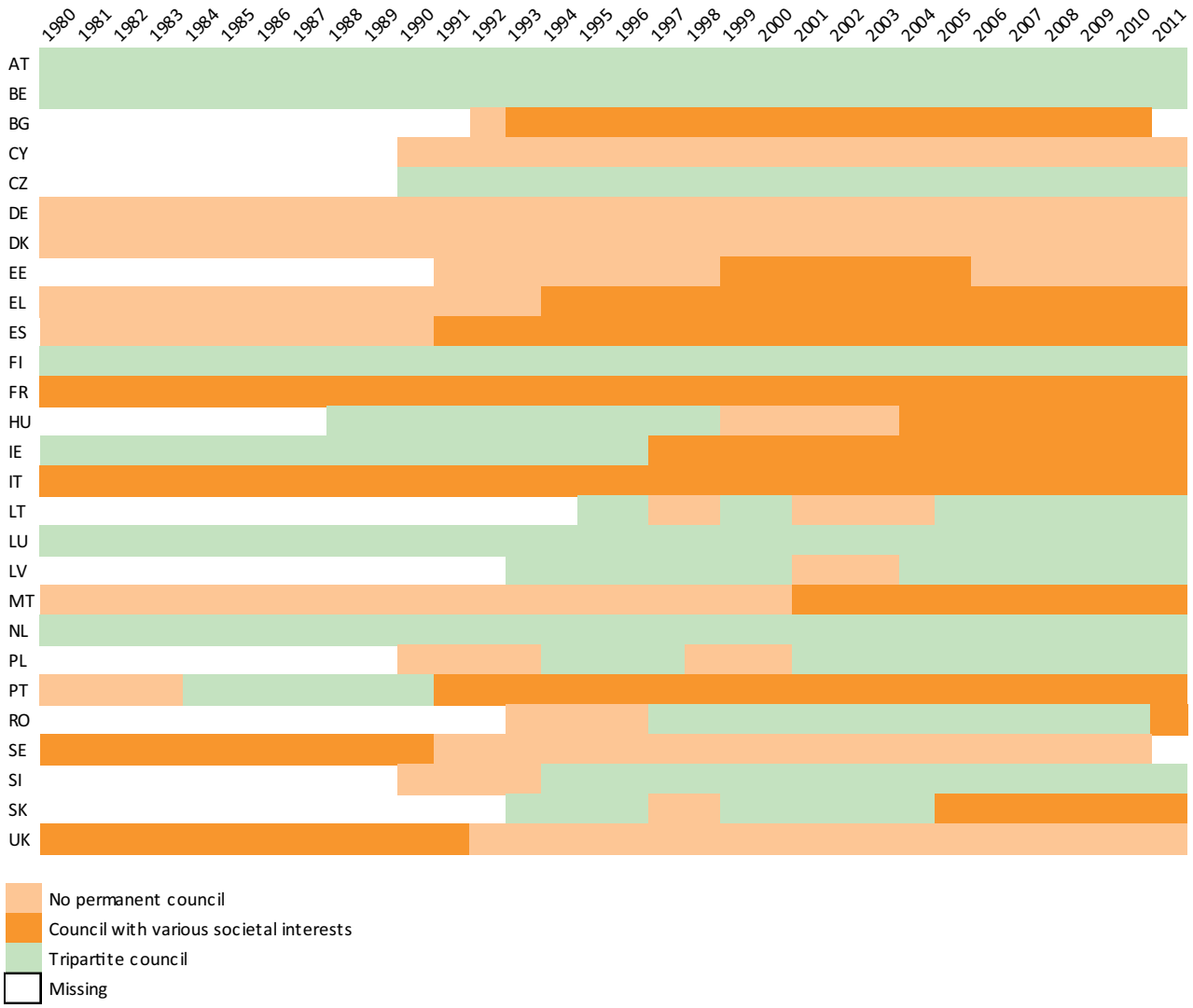
Hypothesis

Government intervention would aim to restrain nominal and real wage growth in exchange for increases in employment levels and to avoid inflationary tendencies, similar to wage pacts.

Description of the relationship

To examine this relationship, the ICTWSS 4.0 variable that indicates the existence of a tripartite council for social and economic policy was used. In some countries, such as Austria, Belgium, Finland, Luxembourg and the Netherlands, the tripartite council has been a feature of the bargaining system for more than 30 years. In contrast, there is no permanent council in charge of overseeing social and economic policy in Cyprus, Denmark, Germany, Sweden or the UK. In France and Italy, councils representing various social interest groups, including employers and unions, have been in place for more than 30 years. Since the 1990s, a number of other countries, including Bulgaria, Greece, Hungary and Spain, have introduced such councils.

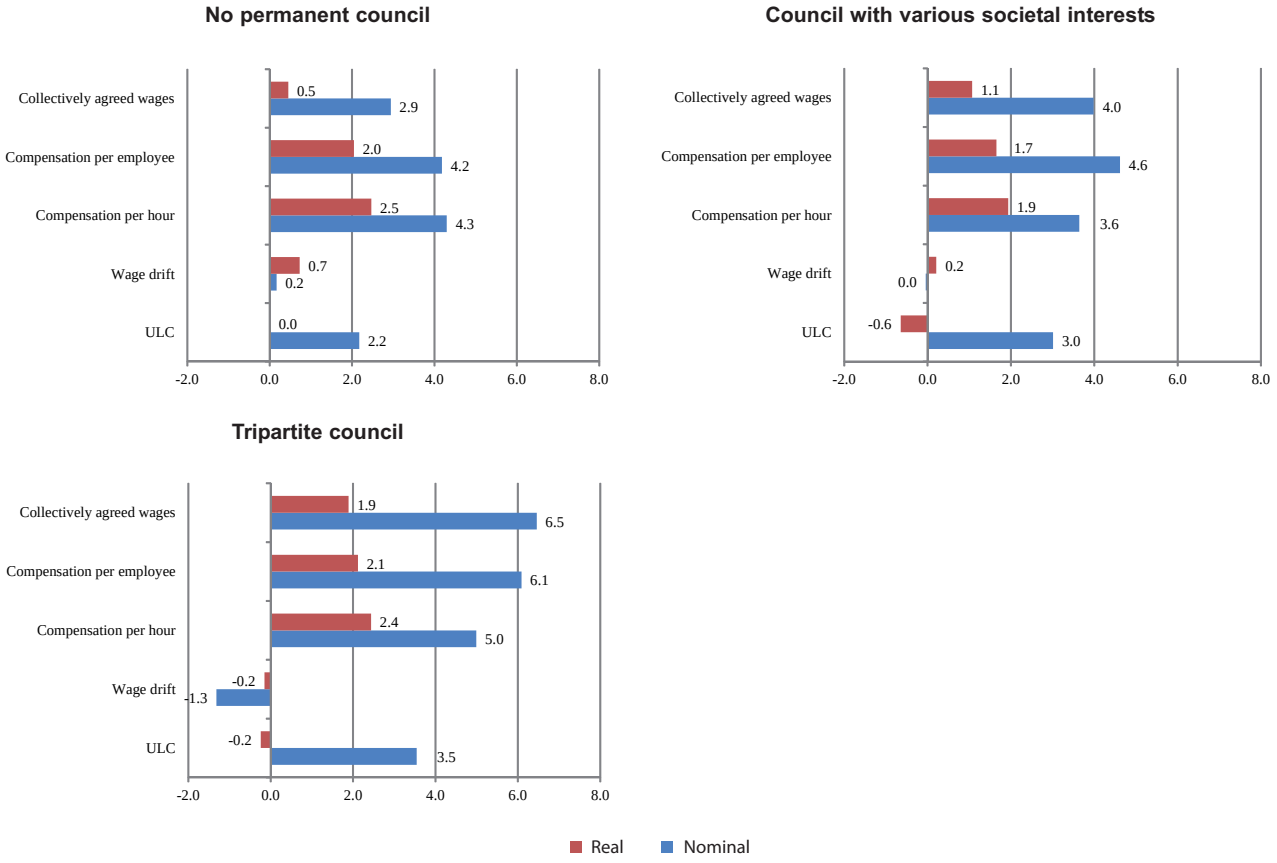
Figure 19: Government participation and tripartite councils



Source: *ICTWSS 4.0*

Figure 20 does not suggest that the existence of councils has a wage-moderating effect. Growth rates of nominal and real wages were highest in countries operating tripartite councils. While real pay grew at the lowest rates in countries without a permanent council, the average growth rate of real hourly compensation was highest in these countries. Overall, this description points to uncertain impacts of tripartite councils on wage outcomes.

Figure 20: Government participation and tripartite councils and average growth rates of pay outcomes (1998–2012)



Note: Average annual growth rates
Sources: *ICTWSS 4.0, AMECO (compensation per employee and ULC), Eurofound (collectively agreed wages), Conference Board (hourly compensation)*

Control variables for multivariate models

Further variables related to government policy and, more generally, the state of the economy influence the relationship between the institutions of the wage-bargaining regime and pay outcomes.

- Taxation and social insurance regulation substantially affect the differences between workers' gross earnings and total compensation in the economy.
- Indirect government intervention in wage bargaining comes from other labour market institutions, such as active labour market policy (ALMP),[13] unemployment benefits as well as other passive labour market policy (such as early retirement), as these alter labour costs and labour supply, which again influence the bargaining position of unions.
- Central bank independence, which affects the difference between nominal and real pay outcomes, has a crucial role in wage bargaining.

[13] ALMP includes training, employment incentives, supported employment and rehabilitation, direct job creation and start-up incentives.

These government policies at national level influencing bargaining and pay outcomes and other control variables are represented in the conceptual framework (Figure 1). The empirical models will include further independent variables derived from these policies and will also control for production technology, the wider context of corporatism, and economic aggregates such as overall employment, unemployment and growth.

The inclusion of such control variables is crucial to understanding whether the estimated link between wage-bargaining regimes and pay outcomes is robust in the presence of differences in the economic cycle and economic policy regimes across Europe.

Characteristics of the national production system

Wage bargaining aims at distributing production outcomes arising under specific market environments and production technologies. There are several relevant variables characterising the production system that can affect the relationship between bargaining institutions and outcomes.

- The number of small firms in the economy, for which collective bargaining in some countries is not binding unless declared generally binding. Examples of this are small firms that do not belong to employer associations, which – due to their non-statutory character in many countries – are not affected by collective bargaining unless bargaining outcomes are extended to cover whole sectors. National differences in the firm structure are therefore controlled by using variables on average firm size.
- Extending the argument made by Danthine and Hunt (1994) that internationalisation results in increased bargaining flexibility, control variables are also included on the degree of international competition in the economy (share of exports and share of imports as a percentage of GDP).
- Production technology (the proportion of capital and labour employed in the production system) varies across countries, as do long-term technological trajectories. Since bargaining and pay outcomes affect the relative factor prices, capital intensity is one of the control variables vital to understanding the long-term impact of bargaining and pay outcomes, to control for long-term substitution of capital and labour in production.
- Differences in country-specific skill levels are another important variable affecting pay outcomes, as earnings rise more dynamically for highly skilled workers. Similar to the microeconomic 'skill-biased technical change' hypothesis, which stipulates that wage inequality increases due to the complementarity of human capital and physical capital (Card and DiNardo, 2002), growth of total collectively agreed wages and labour compensation at macroeconomic level is likely to depend on skill levels in the aggregate economy. Variables on skill levels of the labour force will be included in the model.
- Workers' representation in the production system was also considered as an important control variable, for example the existence and influence of works councils in firms. By being represented in a firm's decision-making, unions involved in collective bargaining gain explicit knowledge of fundamental indicators of business performance, which informs wage-setting behaviour, particularly in systems with increasingly decentralised bargaining. Blien et al (2009) found that the inverse relationship between wages and unemployment at regional level is mitigated by works councils.

Macroeconomy and the business cycle

Periods of sustained increases in economic activity result in increased revenues and profitability at firm level, which allow higher rates of growth of real wages to be achieved without reducing employment than would be possible in periods with slower growth. In contrast, the decrease in macroeconomic demand in recessions reduces profitability as revenues decline, while costs, particularly wage costs, remain unchanged in the very short term. In addition, firms usually have less available credit in recessions, which may translate into lower investment and employment levels. Therefore, firms facing reduced profitability would aim to reduce costs, and a key instrument is the reduction of labour costs.

The obvious impact of the recession is, therefore, a reduction of labour costs to restore short-term profitability, which can be achieved either by reducing employee compensation or employment levels by temporarily closing down production. This clearly has an impact on wage formation by limiting expansive wages until profitability is restored. Flexible bargaining at firm level would restrain growth in pay outcomes until the resumption of normal business activity, while unemployment would, in the medium term, adjust wages flexibly at aggregate level until employment levels are restored and wages can increase again.

Such business cycle effects would all be mitigated by labour market interventions, such as unemployment benefits (including short-term working schemes) and ALMP, which are added to the model as additional covariates. In addition, the adjustment mechanisms are imperfect due to information asymmetries in the labour market, differences in skills demanded by firms and those available on the labour market, and the problem that wages would not adjust flexibly to restore employment levels. These effects would be controlled for by further variables on human capital and labour market flexibility. Nonetheless, the business cycle will be the key variable explaining macroeconomic trends in wage formation; see, for example, Layard et al (1991) on the macroeconomic effects resulting from unemployment, using union wage-setting models.

A variety of control variables of the macroeconomic cycle is therefore included in the framework, in particular unemployment rates and employment levels. These, as well as GDP growth rates, are endogenous in the model. Macroeconomic aggregates such as demand and unemployment result primarily from bargaining outcomes of previous periods and would be included with a time lag.

Information on long-term trends in labour supply was also included by adding variables controlling for the size of the total working age population and migration. In an economy with a given level of employment, additional labour supply would have the same impact as an increase in unemployment to moderate wage claims until the economy is achieving full employment. In contrast, reductions of labour supply due to large cohorts retiring that were not replaced by cohorts of similar size would reduce labour supply. At a given capacity (in the short term), firms would have more difficulties in filling vacancies, and wages would increase.

Corporatism and social partnership outside wage bargaining

While production, human capital, employment and unemployment are the key variables driving pay outcomes in different countries, there are further institutional characteristics of the role of social partners in the economy that are controlled for in the models. This dimension of the conceptual framework aims to model corporatism in the economy more broadly by including indicators of workers' representation. Variables used include:

- routine involvement of unions and employers in economic governance and works councils;
- coordination of unions (numbers of union and employer confederations);
- centralisation (concentration at central or confederation level);
- union density (membership density);
- collective bargaining coverage (coverage of workplaces);
- conflict or collaboration of unions, measured by days of strikes lost to the economy per 1,000 workers.

Economic policy

The activity of the government affects both the bargaining system as such, through the right to associate, bargain collectively and strike, as well as pay outcomes. Pay outcomes are significantly influenced by the redistribution of incomes using fiscal policy, including income replacement payments for people affected by unemployment and ALMP, which helps to restore a high level of employment via skills adjustments or temporary subsidies to compensate for differences in workers' productivity. In addition, as has been described above, the state participates directly in wage formation via tripartite activity, extension, bargaining outcomes or minimum wages.

However, further indirect influence of economic policy arises through mechanisms not directly related to the bargaining regime, which influence labour market and other macroeconomic variables, such as fiscal and monetary policies. These are included in the framework as they have an impact on both real and nominal wage developments.

- Monetary policy is a key variable when analysing the role of the collective bargaining regime, as bargaining affects nominal wages, while the development of real wages is strongly related to inflationary targets. The development of real labour costs, on the other hand, is a typical example of factors taken into account by employers during collective bargaining and equally depends on monetary policy.
- ALMP, vocational education and training, and laws on migration are important policies influencing effective labour supply.
- Social policies and transfers, for example the provision of unemployment benefits, are likely to have an impact on the reservation wage of workers, their actual compensation and total labour costs in the country.
- Financing the welfare state via taxation and social insurance contributions affects the level of actual compensation and labour costs in an economy.

Empirical analysis 3

Empirical modelling

Multivariate regression models

Based on the analytical framework, hypotheses were specified on bargaining institutions and pay outcomes, which were illustrated in the previous chapter in bivariate descriptions of institutional variables and pay outcomes. Since further macroeconomic and institutional characteristics of national economies are likely to affect this relationship, these hypotheses were tested, controlling for the effects of these characteristics. Econometric models were used that explain observed pay outcomes (as dependent variables) using a set of independent variables summarising the institutional features of wage bargaining and further variables describing some characteristics of production, economic policy, and economic and demographic circumstances. The econometric models were set up as multivariate regression models, which aim to obtain estimates of the influence of bargaining institutions on pay outcomes, all things being equal.[14]

More specifically, in the regression models an observed dependent variable changes when any one of the independent variables is varied while other independent variables are held constant. Some models relate metric values – such as levels or growth rates of pay, compensation or labour costs, pay increases, deviation of pay from other measures such as productivity or wage drift – to a set of independent variables. To estimate such models, linear specifications were used, which estimate the conditional expectation of the dependent variable given the independent variables; in other words, the average value of the dependent variable when the independent variables are fixed.

The dependent variables of the empirical models are observed pay outcomes at macroeconomic level:[15]

- nominal and real collectively agreed wages;
- nominal and real ULC;
- nominal and real labour compensation per employee;
- nominal and real labour compensation per hour;
- nominal and real wage drift (differential growth of wages and labour compensation in percentage points).

The independent variables of the models summarise key features of the wage-bargaining regime and further control variables to capture the economic policy regime, corporatism and state intervention in wage bargaining. Variables on the wage-bargaining regime are taken from the ICTWSS 4.0 database and relate to:

- bargaining (or centralisation) level;
- coordination level;
- type of coordination;
- interaction between bargaining level and coordination level;
- interaction between bargaining level and type of coordination;
- opening clauses;
- participation in wage pacts;
- government intervention in collective bargaining;

[14] Note that not all features of a bargaining system can be quantitatively measured. For instance, features such as how the various actors understand each other, the more informal dimensions and trust are difficult to measure and remain unaccounted for in this analysis as no systematic data are available.

[15] All dependent variables except the wage drift are expressed in logarithm.

- the use of extension and derogation clauses;
- direct participation of the government in bargaining and tripartite councils.

Estimating static and dynamic models

To estimate the regression models outlined above, a dataset of all Member States between the early 1990s and 2013 was used.[16] As this provides a long time series, one can estimate models using static and dynamic specifications. Pooled cross-section regression estimates are reported, which do not control for country-level effects, as well as fixed-effects and dynamic panel data models. The discussion of the findings focuses on these latter two models as findings are far more robust.

- The fixed-effect (FE) models can consider country-level effects, for example static differences between wage-growth trends across the different countries.
- Dynamic panel data (DP) models (Blundell and Bond, 1998; Bond, 2002) also allow for the control for country-specific trends in the dependent variable – for example, if the trend in wage growth differs between the countries, which is highly plausible, particularly as the Member States that joined the EU since 2004 experienced a more dynamic growth trend than the pre-2004 Member States in the period of observation.

DP models allow that the dependent variable depends not only on a set of independent variables and country-specific effects, but also on levels of the dependent variable in previous years ('lagged dependent variables'). This is a very realistic assumption as pay outcomes clearly follow multi-year trends, for example due to the business cycle and further longer-term demographic trends.

While dynamic panel data modelling is more robust against country-specific differences than FE models, there are econometric problems when estimating such models because the lagged dependent variable (as a right-hand side regressor) is very closely related to the observed level of the dependent variable in later years. Similarly, the other macroeconomic variables included in the equation, in particular a rise in unemployment, are very closely related to pay outcomes, resulting in problems of reverse causality. Methodologically, both the lagged dependent variable and further 'endogenous variables', without a clear direction of causality, cause explanatory variables to correlate with the error term, so that all coefficients estimated from such models would be biased. Under such circumstances, variables that are correlated with the endogenous explanatory variable, but not with the error term of the model, can be used as 'instrumental variables' to allow a consistent estimate of models suffering from this 'endogeneity' problem.

In order to estimate a DP model as suggested here, the authors rely on extensions of the widely used Generalised Method of Moments (GMM) estimator (Arellano and Bond, 1991; Blundell and Bond, 1998).

- First, time-invariant country-specific effects would be removed similarly to fixed-effect models by estimating the model in first differences rather than in direct levels.
- Second, when estimating the model in first differences rather than levels, this estimator uses lagged levels of dependent and independent variables as instruments for the differences of right-hand side regressors, exploiting the fact that they are not correlated with the error term of the model in first differences.

Interpretation of the estimated coefficients

The estimated coefficients show whether the independent variables significantly influence the observed outcome variables when controlling for other characteristics (all other things being equal). The coefficients of the variables describing the bargaining system – for example, the predominant level of bargaining – show a differential effect of a

[16] The time series is slightly shorter for bargained nominal and real wages taken from the Eurofound database, which begins in 1998.

particular bargaining regime relative to a base category. For instance, in the case of the bargaining level, the effect of bargaining at central or cross-industry level would show the relative impact of this level compared with the base category of company level when all other characteristics are held constant. The different estimates for the different institutional characteristics show whether the features of the bargaining system are actually significantly influencing the observed outcomes, all other things being equal.

If estimates are statistically significantly different from zero, the coefficients obtained from the models also show the magnitude of the effect, for example how much a change in a bargaining institution, such as the introduction of opening clauses, affects the dependent variables, for example nominal gross wages. Because most dependent variables are specified in logarithms, the effects obtained from the level of particular characteristics of the wage-bargaining system are to be interpreted as semi-elasticities, in other words, the percentage change in the level of outcome variables because of a particular institutional feature of the bargaining system, relative to a base category. Compared to a specification in growth rates of outcome variables, which would allow estimating how growth rates would change in percentage points due to variations in independent variables on wage-bargaining institutions, the interpretation of level effects is more straightforward and avoids a further reduction of the sample sizes, which would have resulted from estimating models specified to explain the growth rates.

Specification choice

In addition to the bargaining institutions, some of the model estimates control for further dimensions derived from the conceptual framework,[17] such as:

- variables controlling for the state of the aggregate economy (development of productivity with time lag, inflation and aggregate unemployment, foreign trade or openness of the economy, human capital and production technology variables[18]);
- characteristics of the economic policy regime, in particular ALMP and whether EU monetary policy allows intra-market interventions (for example, in Sweden or the UK, and in other countries before they joined the euro zone), employment protection, and spending on education and training and, more specifically, on vocational training;
- the size of the working-age population relative to the total resident population in the country.

These empirical models were used in order to test the different hypotheses derived above, that is, whether the specific features of the wage-bargaining regime affect pay outcomes when controlling for further variables. The authors focus on evidence resulting from the 'preferred' specification and – although ordinary least squares (OLS) regressions are included in the tables below – this report refers only to FE and DP models.

- The preferred specification includes a restricted set of control variables: development of labour productivity, lagged unemployment rate, lagged consumer price index, aggregate employment rates, and the percentage of working-age population in the entire resident population.

[17] In addition to the variables included here, the conceptual framework further suggests that controlling for indicators of non-bargaining corporatism and further routine involvement of unions and employers in decisions on social policy should be added to the model. However, tests of the specification suggest a high degree of multi-collinearity between these indicators and the features of the bargaining system. The inclusion of these highly correlated variables would have added very little benefit to the specification, so the authors did not include them in the preferred specifications.

[18] The technology operationalised by a ratio of capital per person employed was later removed from the analysis as it was not available consistently and resulted in a significant reduction of available observations without contributing much to an increase in the quality of the model.

- The full specification includes further variables as suggested by the conceptual framework, in particular exports, human capital, European Central Bank (ECB) membership, labour tax, ALMP spending and government expenditure as a percentage of GDP (see Annex 2 for details of the models).

The vector of covariates included in the preferred specification is selected based on measures of goodness of fit (F-test for the OLS and FE models and the chi-square value for the DP model). The intermediate models have the best goodness of fit for all dependent variables and independent variables of interest. Including additional covariates reduces the number of observations, as some variables are not available for some countries or years, and results in poorer goodness of fit.

Testing hypotheses on bargaining regime and pay outcomes

Bargaining level

Table 1 shows coefficient estimates of the effect of the bargaining level on pay outcomes. Relative to the base category of company bargaining, the models do not show that the level of bargaining significantly affects nominal or real bargained wages in any of the FE or DP models.[19]

For pay outcomes from AMECO and Conference Board data (compensation and ULC), a time series spanning more than 20 years is usually available. Since variation in wage-bargaining institutions affected most countries over the longer time series (see Figure 3), all models can be estimated, with the following results.

- The FE and DP models explaining the impact of the level of wage bargaining on compensation per employee and compensation per hour show that, relative to company-level wage bargaining, bargaining at predominantly sector or industry level or alternating between central and industry level results in lower hourly compensation, both in nominal and real terms. The models also show a significant impact on nominal compensation per employee and nominal and real ULC.
- Compared to company-level wage bargaining, bargaining that takes place predominantly at sector or industry level significantly decreases compensation per employee and per hour as well as nominal ULC, while the models show an increasing effect on real ULC.
- A similar relationship is found for bargaining alternating between central and industry levels. The models indicate that bargaining at this level shows reduced labour compensation per hour compared to company-level bargaining. Evidence on the effect on ULC is inconclusive.
- The relationship between bargaining at central or cross-industry level and compensation per hour appears to be similar to bargaining alternating between central and industry levels. The models show that relatively lower compensation per hour results from bargaining at this level. ULC seem to differ significantly compared to bargaining that takes place at company level (nominal ULC are lower while real ULC are higher).

The findings here suggest that company-level bargaining and bargaining alternating between sector and company levels resulted in higher real labour compensation than predominantly sector or industry or centralised bargaining.

[19] Note that some of the models – for example, the effects of bargaining predominantly taking place at sector or industry level or of intermediate (alternating between sector and company) bargaining – cannot be estimated in FE and DP models because there is no variation within the countries over time. If this is the case, the models cannot be estimated because the feature of the bargaining system is perfectly correlated with a country's fixed-level effect, which cancels out from panel data models.

Table 1: Bargaining level and pay outcomes

	Specification	Collectively agreed wages		Compensation per employee		Compensation per hour		ULC		Wage drift	
		Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real
Alternating between sector and company	OLS	-.089**	-.101**	.005	-.03**	.022	-.015	.054**	-.019	1.226	-.447
	FE			0.96**	.05**	.093**	.019	.076**	.093**		
	DP			.022	.012	.017	-.005	.022	.022		
Predominantly sector or industry	OLS	-.045**	-0.74**	-.032*	-.041**	-.012	-.019**	.069**	.014	.127	-.41
	FE			-.043	-.011	-.069*	-.051**	-.081**	.133**	-.301	-.29
	DP	-.002	-.001	-.044**	-.011	-.071**	-.033**	-.052**	.051**	-.205	-1.049
Alternating between central and industry	OLS	.019	-.069**	-.02	-.048**	.023	-.002	.061**	-.02	-.266	-.371
	FE	.01	.005	-.021	-.008	-.044	-.044**	-.056	.153**	.176	.412
	DP	.001	-.004	-0.44**	-.011	-.067**	-.029*	-.056**	.037	0**	.291
Central or cross-industry level	OLS	.017	-.076**	-.006	-.033**	.018	-.006	.073**	.039**	.374	.018
	FE	.008	.004	-.024	-.024	-.036	-.049**	-.06*	.145**	0**	0**
	DP			-.035*	-.007	-.051*	-.022	-.044**	.063**	.959	0**
N	OLS	186	186	355	355	355	355	355	355	188	183
	FE	186	186	355	355	355	355	355	355	188	183
	DP	154	154	329	329	318	318	329	328	152	145
F/X2	OLS	69.8	62.3	194.5	161.8	237.7	204.8	90.8	9	2.1	1.3
	FE	983.1	94.9	319.2	239.8	396.2	331.4	119.3	24.9	1.3	1.6
	DP	46,464.5	1,668.9	1,361.1	12,894.7	9,525.3	8,072.5	5,069.7	1,077.2	30.1	56.7

Notes: Bargaining level base category: company level. Wages, compensation (per employee/per hour) and ULC: log level (index); wage drift: percentage point differences in growth rates.
* significant at 10% level, ** significant at 5% level
Sources: *ICTWSS 4.0, AMECO (compensation per employee and ULC), Eurofound (collectively agreed wages), Conference Board (compensation per hour); authors' calculations*

Coordination level

Results from the FE and DP models reported in Table 2 show an unclear picture of how the coordination level of wage bargaining affects pay outcomes. The DP models do not yield significant results, while the FE models suggest that, compared to fragmented wage bargaining, coordinated wage bargaining at any level (mixed, informal or centralised) results in higher nominal and real compensation per employee. However, this effect is not found in the DP models.

Overall, the econometric analysis confirms the findings of the descriptive analysis that the level of coordination and pay outcomes show no obvious association in the data.

Table 2: Coordination level and pay outcomes

	Specification	Collectively agreed wages		Compensation per employee		Compensation per hour		ULC		Wage drift	
		Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real
Mixed industry- and firm-level	OLS	.039*	-.018	.088**	.028**	.098**	.041**	-.051**	-.07**	.837	-.429
	FE	-.022*	.006	.162**	.09**	.097**	.022	.11**	.036	-.4	-.383
	DP	-.007	.016	.019	.01	.005	-.002	.015	-.001	-.056	1.771
Informal	OLS	-.029	-.044**	.025	-.012	.038*	.008	-.027	-.051**	1.393	-.164
	FE	-.013	.019	.051	.044**	.008	.002	.016	-.005	-.156	-1.009
	DP	-.003	.018*	-.012	.001	-.016	-.016	-.019	-.025	-1.055	-.047
Centralised	OLS	.011	-.037**	.017	-.014	.018	-.006	.005	-.001	.861	-.316
	FE	-.008	.018	.068	.04**	.016	-.008	.031	.018	-.453	-1.235
	DP	-.004	.014	-.013	-.001	-.021	-.017	-.021	-.014	-.736	-.167
N	OLS	186	186	355	355	355	355	355	355	188	183
	FE	186	186	355	355	355	355	355	355	188	183
	DP	154	154	329	329	318	318	329	328	152	145
F/X2	OLS	58.8	30.2	225.2	182.7	279	245.8	98.3	12	2.2	1.3
	FE	914.9	88.2	380.8	286.8	435.5	353.2	134.9	25.7	1.2	1.4
	DP	46,244.6	1,648.9	13,577.1	12,985.1	9,326.4	7,997.5	5,000.6	1,035.5	29.7	59

Notes: Coordination level base category: fragmented bargaining. Wages, compensation (per employee/per hour) and ULC: log level (index); wage drift: percentage point difference in growth rates.
* significant at 10% level, ** significant at 5% level
Sources: *ICTWSS 4.0, AMECO (compensation per employee and ULC), Eurofound (collectively agreed wages), Conference Board (compensation per hour); authors' calculations*

Type of coordination

The second variable describing coordination is type of coordination of wage bargaining, that is, the behavioural patterns or activities of the major players (unions, employers and government) involved in wage setting. The results suggest that this has a clear impact on most pay outcomes. Table 3 provides a summary of the findings.

- Compared to uncoordinated wage bargaining, state-sponsored or state-imposed bargaining (including pacts) and intra- or inter-associational coordination result in lower employee compensation and hourly compensation in nominal and real terms.
- There is no association between nominal and real collectively agreed wages and the type of coordination, although the absence of significant coefficients may be due to the lower number of observations for bargained wages.
- There are some negative effects of higher degrees of coordination (intra- or inter-associational and state-sponsored or state-imposed bargaining) on nominal ULC found in the FE and DP models.

Table 3: Type of coordination and pay outcomes

	Specification	Collectively agreed wages		Compensation per employee		Compensation per hour		ULC		Wage drift	
		Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real
Pattern bargaining	OLS	-.04**	-.029**	-.052**	-.037**	-.056**	-.035**	.068**	.057**	.093	-.439
	FE	.016	0	-.077**	-.026*	-.093**	-.036**	-.068**	0	2.221	-1.402
	DP	.005	-.002	-.025	-.012*	-.032	-.03**	-.025	-.01	1.442	-2.992*
Intra-associational/ inter-associational	OLS	-.004	-.041**	-.027	-.034**	-.028*	-.03**	-.004	-.014	1.351	.323
	FE	.017	0	-.117**	-.045**	-.115**	-.038**	-.107**	-.065**	1.786	-1.21
	DP	.003	-.007	-.035**	-.017**	-.033*	-.026**	-.041**	-.044**	2.584	-1.946
State-sponsored or state-imposed	OLS	-.011	-.039**	-.011	-.027**	-.012	-.023**	.039**	.041**	1.028	.168
	FE	.015	-.002	-.076**	-.042**	-.076**	-.036**	-.07**	-.022	2.111	-1.284
	DP	.001	-.007	-.021*	-.014**	-.021	-.023**	-.024**	-.015	2.156	-2.062*
N	OLS	186	186	355	355	355	355	355	355	188	183
	FE	186	186	355	355	355	355	355	355	188	183
	DP	154	154	329	329	318	318	329	328	152	145
F/X2	OLS	53.7	33.9	214.4	177.5	262.2	233	101.3	11.2	2.5	1.5
	FE	887.5	85.4	361.6	263.7	439.4	357.6	132.1	26.9	1.3	1.5
	DP	47,005.4	1,701.3	13,399.3	12,932.4	9,359.2	8,050.9	4,961.4	1,042	30.2	64.1

Notes: Type of coordination base category: uncoordinated. Wages, compensation (per employee/per hour) and ULC: log level (index); wage drift: percentage point differences in growth rates.
* significant at 10% level, ** significant at 5% level
Sources: *ICTWSS 4.0, AMECO (compensation per employee and ULC), Eurofound (collectively agreed wages), Conference Board (compensation per hour); authors' calculations*

Opening clauses

Table 4 shows the relationship between the existence and use of opening clauses and pay outcomes obtained from the econometric models. The use of opening clauses has no marked impact on most pay outcomes, with the exception of lower nominal collectively agreed wages and higher nominal compensation per employee and hourly compensation in regimes with exceptional use of opening clauses compared to the base category of regimes with no opening clauses as there are no sectoral or national agreements. In the authors' view, these findings are weak as DP models do not result in significant estimates or show effects pointing in the opposite direction, while none of the real pay outcome variables is significantly affected.

The only other evidence on the impact of opening clauses on pay outcomes is in relation to real ULC. The use of opening clauses (whether it is general, limited or exceptional) is also associated with higher real ULC relative to the base category of not using opening clauses, which is consistent with the descriptive analysis presented in Figure 14.

Table 4: Opening clauses and pay outcomes

	Specification	Collectively agreed wages		Compensation per employee		Compensation per hour		ULC		Wage drift	
		Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real
Generalised/ widespread	OLS	-.059**	-.071**	.001	-.025**	.018	-.007	.074**	.041**	-.093	.557
	FE			.007	.015	-.003	-.016	-.015	.111**		
	DP	.005	0.000	-.008	.007	-.051	-.006	-.014	.033	-2.187	-2.65
Limited	OLS	-.043**	-.088**	-.022	-.035**	-.01	-.021**	.065**	.028*	1.006	-.141
	FE	-.01	-.001	.049	.019	.04	-.011	.019	.113**	-.546	-1.748
	DP	.01	0.000	-.005	.001	-.036	-.019	-.008	.042**	-.797	-1.409
Exceptional	OLS	.029	-.074**	-.021	-.048**	.012	-.014	.055**	-.045**	.243	-0.828
	FE	-.03**	-.015	.082**	.028	.076**	.001	.044	.102**	-1.333	-1.481
	DP			-.013	-.011	-.055*	-.018	-.014	.024		
N	OLS	186	186	355	355	355	355	355	355	188	183
	FE	186	186	355	355	355	355	355	355	188	183
	DP	154	154	329	329	318	318	329	328	152	145
F/X2	OLS	75.7	66.5	209.9	179.8	257	222.8	99.4	14	2.3	1.6
	FE	1,015.5	96.2	342.4	244.6	417.6	344.9	122.9	26.8	1.3	1.7
	DP	47,177.2	1,653.6	13,145.8	12,857.5	9,140.7	7,960.4	4,862	1,054.3	29.3	56.2

Notes: Opening clauses base category: no opening clauses as there are no sectoral or national agreements. Wages, compensation (per employee/per hour) and ULC: log level (index); wage drift: percentage point differences in growth rates.
* significant at 10% level, ** significant at 5% level
Sources: *ICTWSS 4.0, AMECO (compensation per employee and ULC), Eurofound (collectively agreed wages), Conference Board (compensation per hour); authors' calculations*

Wage pacts

The empirical analyses of the FE and DP models show significant moderating effects of wage pacts (Table 5) only on collectively agreed wages in real terms. However, the effects on other pay outcomes are not consistently statistically significant. No significant effects were found on compensation per employee. Where significant, the magnitude of the effect is about half the effect found in the FE models.

The estimates also show effects on wage drift. Real wage drift is significantly reduced when a pact is being proposed, which is consistent with the observation that real collectively agreed wages decrease significantly but not as much as the real compensation per hour decreases.

Table 5: Wage pacts and pay outcomes

	Specification	Collectively agreed wages		Compensation per employee		Compensation per hour		ULC		Wage drift	
		Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real
Pact (publicly) proposed	OLS	-.002	-.021**	.014	-.004	.008	-.009	.008	-.004	.572	-.048
	FE	-.003	-.008**	.011	-.003	.007	-.008	.009	-.006	.016	-.551
	DP	-.002	-.003	.001	-.002	-.001	-.004	0	-.003	-.376	-.897**
N	OLS	186	186	355	355	355	355	355	355	188	183
	FE	186	186	355	355	355	355	355	355	188	183
	DP	154	154	329	329	318	318	329	328	152	145
F/X2	OLS	63	33.8	257	199.4	312.4	270.5	112.3	10.2	2.7	1.6
	FE	1,085.5	110.4	406.5	298.3	494.2	424	147.7	30.2	1.5	1.8
	DP	47,749.1	1,687.5	13,209.4	12,836.6	9,234.9	8,003.9	4,909.9	1,022.6	30.4	62.4

Notes: Wage pact base category: no social pact (publicly) proposed by government, unions or employers. Wages, compensation (per employee/per hour) and ULC: log level (index); wage drift: percentage point differences in growth rates.
* significant at 10% level, ** significant at 5% level
Sources: *ICTWSS 4.0, AMECO (compensation per employee and ULC), Eurofound (collectively agreed wages), Conference Board (compensation per hour); authors' calculations*

Extension by government and equivalent mechanisms

As shown in Figures 17 and 18 (the description of outcomes in relation to extension mechanisms), there is some evidence of higher growth of most pay outcomes in countries without extension or with exceptional extension of bargained wages to general coverage. There is some evidence that regimes with exceptional or widely used extensions are associated with lower growth of real compensation per hour compared to the base category of no extension mechanism.

Further, exceptional extension compared to no extension at all is associated with lower real wage drift, which is consistent with the findings that wage growth is significantly lower in such regimes, but not by as much as real compensation per hour.

Table 6: Extension by governments and pay outcomes

	Specification	Collectively agreed wages		Compensation per employee		Compensation per hour		ULC		Wage drift	
		Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real
Exceptional	OLS	-.015	-.041**	-.029	-.046**	-.036	-.048**	.054**	.034*	-.038	-.398
	FE	-.013	-.002	.001	-.007	-.053	-.061**	-.003	.017	-2.206	-1.283
	DP	.007	-.018*	.012	.003	-.03	-.038**	.018	.029	-2.367	-3.428**
Used in many industries	OLS	-.064**	-.069**	-.044**	-.028**	-.048**	-.027**	.026	.015	.923	.11
	FE	.031	.016	-.111*	-.041	-.117**	-.046*	-.086	.018		
	DP			-.028	-.021*	-0.49	-.04**	.003	.066*		
Virtually automatic	OLS	.009	-.05**	-.097**	-.073**	-.083**	-.054**	.037*	-.053**	.541	-.772
	FE										
	DP										
N	OLS	186	186	355	355	355	355	355	355	188	183
	FE	186	186	355	355	355	355	355	355	188	183
	DP	154	154	329	329	318	318	329	328	152	145
F/X2	OLS	60.3	41.3	229.5	197.2	268.8	236.6	94.1	14.3	2.2	1.5
	FE	1,015.3	95.2	371.1	270.1	448.9	394	134	27	1.5	1.7
	DP	45,966.3	1,647.2	13,194.4	12,688.2	9,486.3	8,501.3	4,847.8	1,019.2	32.2	59.9

Notes: Wage pact base category: no social pact (publicly) proposed by government, unions or employers. Wages, compensation (per employee/per hour) and ULC: log level (index); wage drift: percentage point differences in growth rates.
* significant at 10% level, ** significant at 5% level
Sources: *ICTWSS 4.0, AMECO (compensation per employee and ULC), Eurofound (collectively agreed wages), Conference Board (compensation per hour); authors' calculations*

Government participation in bargaining and tripartite councils

The results presented in Table 7 indicate that tripartite councils with representation from unions, employers and government have moderating effects on real compensation per employee, as found by the DP models. Both the FE and DP models highlight the moderating effect of councils with various societal interests on nominal collectively agreed wages, which contrasts with the positive effect on real wages found in the DP models.

Table 7: Existence of a standard tripartite council and pay outcomes

	Specification	Collectively agreed wages		Compensation per employee		Compensation per hour		ULC		Wage drift	
		Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real
Council with various societal interests	OLS	.046**	-.05**	.056**	-.003	.067**	.007	-.021	-.074**	1.636*	.678
	FE	-.038**	.005	.02	.004	.037	.008	.018	-.056**	2.974	2.755
	DP	-.014**	.024**	-.012	-.006	.015	.002	-.01	-.027		
Tripartite council	OLS	-.025	-.049**	-.01	-.004	-.027*	-.02**	-.021*	.009	2.156**	.449
	FE			-.004	-.008	.018	.011	.001	.043	1.883	2.75
	DP			-.021	-.013**	.018	-.009	-.007	.025		
N	OLS	186	186	355	355	355	355	355	355	188	183
	FE	186	186	355	355	355	355	355	355	188	183
	DP	154	154	329	329	318	318	329	328	152	145
F/X2	OLS	68.4	38.5	246.7	178.8	322.6	255.2	101.8	15.3	3.1	1.6
	FE	1,136.8	105.7	364.7	268.3	445.8	377.9	132.5	30.7	1.4	1.7
	DP	47,768.2	1,694	13,140	12,472.4	9,380.8	7,918.6	4,864.4	1,044.1	29.7	55.1

Notes: Wage pact base category: no social pact (publicly) proposed by government, unions or employers. Wages, compensation (per employee/per hour) and ULC: log level (index); wage drift: percentage point differences in growth rates.
* significant at 10% level, ** significant at 5% level
Sources: *ICTWSS 4.0, AMECO (compensation per employee and ULC), Eurofound (collectively agreed wages), Conference Board (compensation per hour); authors' calculations*

Interaction of bargaining level and coordination level

Table 8 shows the relationship between a combination of coordination level and bargaining level and pay outcomes. The base category is bargaining regimes characterised by an intermediate bargaining level (predominantly sector or industry bargaining or bargaining alternating between company and sector level) and mixed industry-level and firm-level/informal coordination. Compared to that category, lower-level bargaining combined with mixed industry- and firm-level coordination results in higher real hourly compensation. Centralised bargaining combined with mixed industry- and firm-level coordination appears to result in higher real employee compensation and hourly compensation (although this is significant only at 10% level).

This suggests that decentralised and centralised regimes produce similar outcomes when operating at intermediate levels of coordination. There is some indication that fragmented wage bargaining taking place at the establishment, company or sector level is associated with lower employee compensation compared to an intermediate level of bargaining and mixed industry- and firm-level/informal coordination. However, this is not confirmed by DP models.

Table 8: Combination of coordination level and bargaining level and pay outcomes

	Specification	Collectively agreed wages		Compensation per employee		Compensation per hour		ULC		Wage drift	
		Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real
Fragmented; local or company/ intermediate	OLS	-.005	.047**	-.042**	.008	-.053**	-.007	.001	.046**	-1.625	-.063
	FE	.02*	-.009	-.11**	-.067**	-.055	-.011	-.066	-.019	.446	.694
	DP	.006	-.015	-.001	-.003	.005	.009	.004	.011	.343	-.693
Mixed industry- and firm-level/informal; local or company	OLS	.101**	.12**	.093**	.067**	.082**	.055**	-.126**	-.03	.159	.867
	FE	0**	0**	-.017	.018	.04	.071**	.033	-.229**	0**	0**
	DP	0**	0**	-.02	-.002	.052*	.044**	-.011	-.108**	0**	0**
Mixed industry and firm-level/informal; centralised	OLS	.12**	.045**	-.037	.003	.025	.067**	-.037*	-.058**	-2.488*	-.585
	FE	-.033*	-.014	-.018	.003	-.018	.008	-.017	.023	1.267	1.807
	DP	0**	0**	.006	.018**	.043*	.021*	0	-.002	0**	0**
Centralised; local or company	OLS	0**	0**	-.148	-.028	-.381**	-.261**	-.313**	-.035	0**	0**
	FE	0**	0**	-.154*	.001	-.291**	-.139**	-.074	-.168*	0**	0**
	DP	0**	0**	.016	.027	-.053	-.055*	.048	-.059	0**	0**
Centralised; intermediate	OLS	-.014	.009	-.051**	-.013*	-.054**	-.014*	.025**	.045**	-1.067	-.578
	FE	-.001	-.008	-.011	-.004	-.013	-.004	-.008	0	-1.121	-1.396
	DP	-.005	-.007	-.01	-.003	0	.003	-.01	.001	-.36	-1.78**
Centralised; centralised	OLS	.061**	.008	.003	-.004	.001	-.004	.02	.048**	-.326	.206
	FE	.008	.004	.013	-.013*	.022	-.001	.017	.001	.314	.428
	DP	.002	-.002	-.005	-.003	.004	.006	-.007	-.002	.788	1.06
N	OLS	186	186	355	355	355	355	355	355	188	183
	FE	186	186	355	355	355	355	355	355	188	183
	DP	154	154	329	329	318	318	329	328	152	145
F/X2	OLS	65.0	47.9	187.0	150.4	238.2	235.9	94.2	10.0	2.2	1.5
	FE	851.9	79.9	266.7	200.9	338.4	308.9	95.7	23.0	1.1	1.5
	DP	46,779.3	1,634.6	13,131.6	12,571.4	9,320.4	7,938.7	4,838.3	1,093.4	29.0	60.6

Notes: Wage pact base category: no social pact (publicly) proposed by government, unions or employers. Wages, compensation (per employee/per hour) and ULC: log level (index); wage drift: percentage point differences in growth rates.
* significant at 10% level, ** significant at 5% level
Sources: *ICTWSS 4.0, AMECO (compensation per employee and ULC), Eurofound (collectively agreed wages), Conference Board (compensation per hour); authors' calculations*

Interaction of bargaining level and type of coordination

Table 9 shows the relationship between a combination of type of coordination and bargaining level and pay outcomes. Compared to the intermediate wage-bargaining level associated with pattern and intra-/inter-associational coordination, uncoordinated and low-level bargaining results in higher compensation per employee and hourly compensation both in nominal and real terms. This is consistent with the assumption that pattern bargaining can be an effective mechanism to achieve a high degree of coordination, as occurs in Germany and Austria.

The FE model indicates that uncoordinated and intermediate-level bargaining results in higher employee compensation, both in nominal and real terms, compared to the reference category. Intermediate-level bargaining yields higher nominal employee compensation, hourly compensation and ULC when the bargaining process is coordinated by the state rather than through pattern or intra-/inter-associational coordination; the results are similar for centralised bargaining coordinated by the state. However, this relationship is observed only in FE models.

Table 9: Combination of type of coordination and bargaining level and pay outcomes

	Specification	Collectively agreed wages		Compensation per employee		Compensation per hour		ULC		Wage drift	
		Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real
Uncoordinated; local or company	OLS	-.052**	-.023**	.053**	.024**	.05**	.013	.008	-.024	1.155	.039
	FE	-.009	.007	.11**	.043**	.119**	.043**	.109**	.013	.671	1.203
	DP	-.006	.005	.031**	.015**	.039**	.025**	.038**	.019	1.046	1.598
Uncoordinated; intermediate	OLS	.094**	.022**	.003	.026*	.079**	.101**	-.033	-.096**	-2.217	-.761
	FE	-.038*	-.018	.152**	.126**	.056	.03	.107	.212**	1.569	2.059
	DP			0**	0**	0**	0**	0**	0**	0**	0**
Uncoordinated; centralised	OLS			.023	.046**	-.005	.016	-.102**	-.122**	8.902**	.203
	FE			.001	.008	-.002	.014	.038	-.139**	11.528**	0**
	DP			.036*	.013	.051*	.023	.046**	-.043*	13.206**	-.54
Pattern/intra- or inter-associational; local or company	OLS	.037**	.073**	.041**	.047**	.026	.028**	-.057**	-.005	-.262	.408
	FE	0**	0**	.073*	.01	.105**	.064**	.092**	-.062	0**	.145
	DP	0**	0**	.027	.007	.056	.057**	.036	.001	0**	0**
Pattern/intra- or inter-associational; centralised	OLS	.117**	.013	.074*	-.058**	.073*	-.059**	.004	-.054*	-.268	-.558
	FE	.017*	.012	.013	-.007	.02	.003	.019	-.019	-.818	-.436
	DP	.008	-.009	-.023	-.009	-.016	.003	-.032*	-.05**	-1.464	-.868
State; intermediate	OLS	-.026	-.013*	.046*	-.002	.053**	.005	.008	-.015	.116	-.477
	FE	-.005	-.003	.038**	.008	.046**	.014	.037**	.003	-.363	-.632
	DP	-.004	-.002	.004	-.004	.013	.004	.009	.006	-.855	-.866
State; centralised	OLS	.038**	-.006	.026*	.012*	.03*	.016**	.01	.024*	.375	.566
	FE	.004	.001	.027*	-.004	.032**	.003	.028*	.022	.899	.925
	DP	.001	.001	.011	.005	.017	.009	.011	.015	1.224	2.045**
N	OLS	186	186	355	355	355	355	355	355	188	183
	FE	186	186	355	355	355	355	355	355	188	183
	DP	154	154	329	329	318	318	329	328	152	145
F/X2	OLS	66.3	56.2	157.8	139.0	193.7	194.4	72.8	8.6	2.2	1.3
	FE	776.5	73.1	260.9	200.0	321.2	262.4	95.4	21.2	1.5	1.3
	DP	47,613.9	1,657.5	13,399.3	13,157.0	9,385.7	8,020.4	4,982.8	1,066.7	42.6	74.7

Notes: Wage pact base category: no social pact (publicly) proposed by government, unions or employers. Wages, compensation (per employee/per hour) and ULC: log level (index); wage drift: percentage point differences in growth rates.
* significant at 10% level, ** significant at 5% level
Sources: *ICTWSS 4.0, AMECO (compensation per employee and ULC), Eurofound (collectively agreed wages), Conference Board (compensation per hour); authors' calculations*

Conclusion 4

This macroeconomic analysis explores the role of national wage-bargaining institutions in determining pay outcomes. It builds on the theoretical propositions of Calmfors and Driffill (1988) that both highly centralised and highly decentralised regimes align wages and productivity, ensuring a high level of employment, and those of Soskice (1990) and Traxler (2003) that posit that a high degree of coordination of wage bargaining can bring moderate wage increases and, as a consequence, macroeconomic stability.

The main part of the study consists of descriptive and multivariate analyses of how characteristics of the bargaining regime and the participation of government in the formation of wages affect pay outcomes at macroeconomic level. These analyses are based on a dataset covering all EU Member States between the early 1990s and 2013, which combines:

- data on pay outcomes from Eurofound (quantitative information on collectively agreed pay developments from 1998);
- further pay outcomes and macroeconomic data from the annual macroeconomic database (AMECO) of the European Commission's Directorate-General for Economic and Financial Affairs (DG ECFIN);
- quantitative and qualitative data on the characteristics of wage-bargaining regimes from Jelle Visser's Database on Institutional Characteristics of Trade Unions, Wage Settings, State Interventions and Social Pacts (ICTWSS 4.0).

Using fixed-effects (FE) and dynamic panel data (DP) models, with further variables on government policy and, more generally, the state of the economy, the impact of the following characteristics of the bargaining regime on pay outcomes were estimated:

- bargaining level;
- coordination level;
- type of coordination;
- opening clauses;
- wage pacts;
- extension and derogation clauses;
- government intervention in wage bargaining and the presence of tripartite councils.

In these analyses, the following pay outcome variables were examined:

- nominal and real collectively agreed wages;
- nominal and real labour compensation per employee;
- nominal and real labour compensation per hour;
- nominal and real unit labour costs (ULC);
- nominal and real wage drift (differential growth of wages and labour compensation).

Synthesising the findings

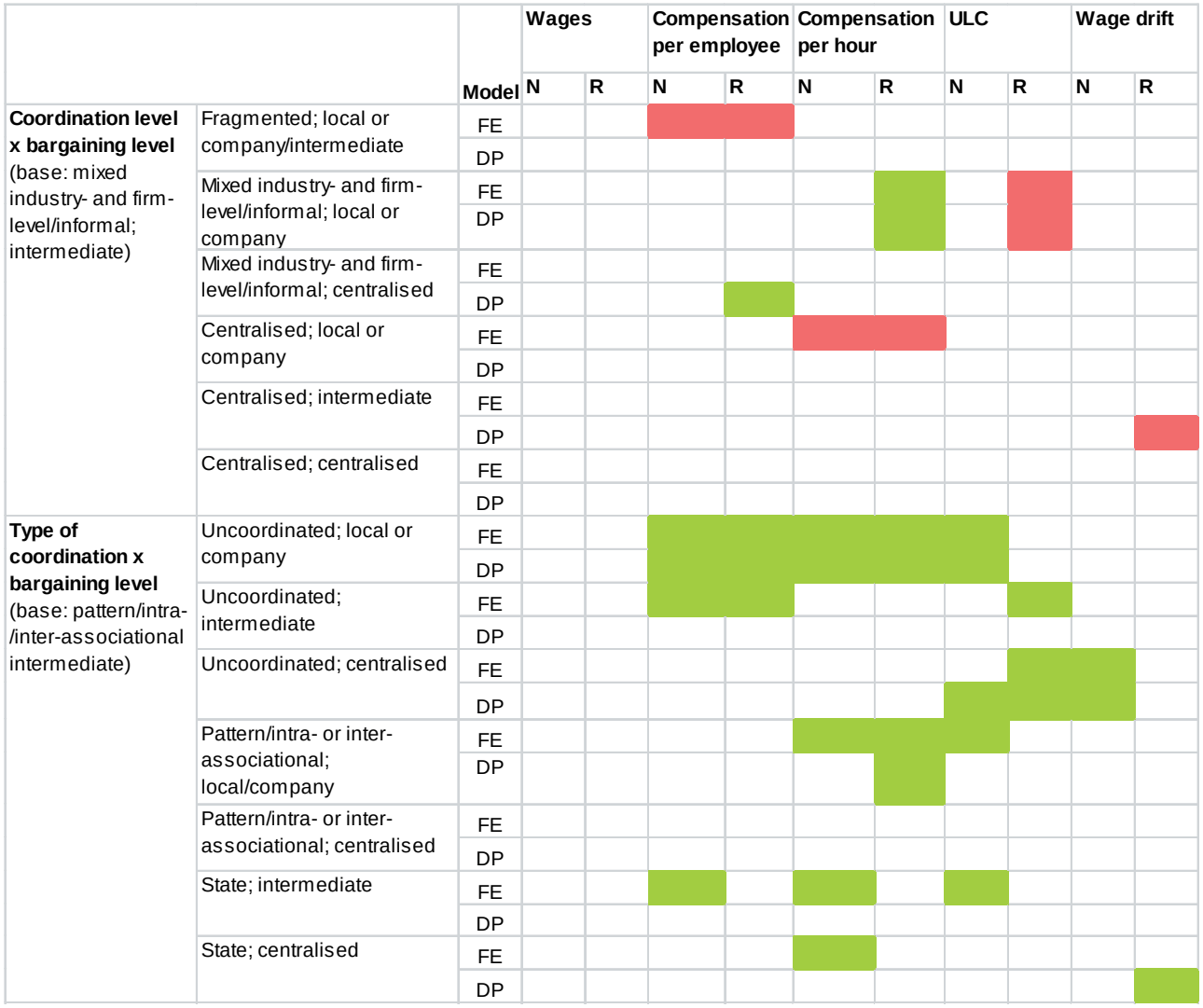
Figure 21 depicts a summary of the findings of the FE and DP models described in the previous chapter. The evidence obtained from these models (and the full range of models, shown in Annex 2) allows the following conclusions to be drawn about the effect on pay outcomes of institutional features of the bargaining regime.

- There is evidence that the type of coordination is the main feature that affects pay outcomes. Using Visser's (2013b) typology, the analysis finds relatively lower growth of nominal and real hourly compensation in regimes with pattern bargaining, intra- and inter-associational bargaining, and state-sponsored or state-imposed bargaining, compared to uncoordinated wage bargaining. This is evidence of a wage-moderating effect of coordination. In addition, the bargaining level remains an important factor to explain pay outcomes. However, the analysis does not show an inverted U-shaped relationship between the level of bargaining and pay outcomes as originally proposed by Calmfors and Driffill (1988), but a 'shifted' relationship, with the highest pay outcomes related to bargaining alternating between sector and company levels.
- There is a tendency for regimes where bargaining alternates between sector and company levels to increase pay outcomes (albeit not wages) compared to regimes with just company-level bargaining, while higher levels of centralisation (sector only and above) have a moderating effect.
- Based on the analysis of level of coordination, higher coordination levels (mixed coordination of industry-level and firm-level and above) are associated with higher real compensation costs for employees, compared to uncoordinated bargaining (the base category in ICTWSS 4.0), although this finding is not robust across specifications, so the overall impact is expected to be weak.

The findings of the effects of other features of the wage-bargaining system on pay outcomes remain inconclusive based on the analysis carried out here. There is some evidence that:

- the combination of intermediate-level bargaining and state-moderated or pattern bargaining leads to significantly lower pay outcomes, confirming the crucial role of coordination in achieving moderate wage increases relative to uncoordinated bargaining;
- bargaining regimes that make some (limited) use of opening clauses experience higher pay outcomes (for nominal compensation per employee and compensation per hour);
- the use of extension mechanisms is associated with lower pay outcomes, which suggests that extension is undertaken only for moderate bargaining outcomes and, hence, extension is endogenous.

Figure 21: Findings of the multivariate analysis



Notes: The table shows FE and DP specifications on how the main characteristics of wage-bargaining regimes (shown in the rows) affect different nominal (N) and real (R) pay outcome variables when controlling for further characteristics in multivariate models. Colours indicate the following:

effect on outcome variable is negative and significant (<5% level)

effect on outcome variable is positive and significant (<5% level)

Sources: *ICTWSS 4.0, AMECO (compensation per employee and ULC), Eurofound (collectively agreed wages), Conference Board (hourly compensation); authors' calculations*

Interpreting the evidence

The results indicate that the key institutional variables of wage-bargaining regime that influence pay outcomes are the type of coordination (how coordination is achieved), as initially discussed by Traxler (2003), and the wage-bargaining level. There were several findings.

- Compared to uncoordinated wage bargaining, all types of coordination, such as pattern bargaining, intra- and inter-associational bargaining, and state-sponsored or state-imposed bargaining, result in significantly lower average pay outcomes.

- On the level of bargaining, the econometric analysis shows that institutional regimes operating company-level wage bargaining or bargaining that alternates between sector and company levels are associated with higher pay outcomes than predominantly intermediate (sector) level and higher levels of bargaining. This suggests that wage moderation occurs with increasing centralisation of bargaining, which is at odds with the prediction of the Calmfors and Driffill (1988) theory.
- Both type of coordination and bargaining level also affect nominal ULC, which are interpreted as a measure of wage-related competitiveness (increasing nominal unit labour costs would imply that compensation was growing faster than labour productivity). Nominal ULC was found to have grown significantly more slowly in regimes with higher levels of bargaining and in coordinated regimes compared to regimes bargaining at company or local level or without bargaining coordination.

Obviously, highly centralised unions have strong incentives to achieve high employment outcomes. Sector unions, for example, which do not compete for members, would aim to avoid bargaining outcomes that might reduce the employment levels of their members. Under a fixed inflation target of monetary policy as set under the EMU, a strategy of claiming high wage increases, exceeding a sustainable development of productivity, would inevitably result in negative employment effects. Therefore, moderate growth in pay outcomes is very plausible under highly centralised unions. In addition, many studies (starting with Soskice, 1990) also found reasons why a high degree of coordination of collective bargaining would result in a strategy of wage moderation and high employment levels in order to achieve macroeconomic stability. The results of this study provide further evidence for the strength of these findings.

In contrast to a high coordination level and centralised wage bargaining, the estimates also show that uncoordinated bargaining at company level, which does not follow an objective of achieving high levels of employment in the economy, results in higher pay outcomes, on average. This is, to some extent, consistent with microeconomic evidence on the existence of a union-wage premium, as found in research of the UK and the US. At macroeconomic level, this would only correspond to a better outcome if employment levels remained constant and macroeconomic imbalances from increased wages could be avoided. Such a situation could indeed exist if firms achieved high levels of profitability, so that there was scope to increase wages without inducing negative employment effects. Under such conditions, introducing some elements of company-level bargaining could complement coordinated or higher-level bargaining and result in increased pay outcomes in very profitable firms without creating a great risk to an overall objective of wage moderation aiming to increase aggregate employment. However, as stated in a recent Eurofound report (2014), such bargaining regimes would also result in a wider wage distribution compared to ‘more centralised or coordinated bargaining (such as in Sweden via pattern setting industries)’ (p. 22).

The third key finding is that significantly lower nominal ULC growth is associated with regimes characterised by higher degrees of coordination and levels of centralisation (productivity growth exceeding the growth of compensation costs in countries with such bargaining institutions, more than in countries with uncoordinated bargaining and company- or local-level bargaining). In contrast, real ULC growth is unaffected by type of coordination and is positively influenced by levels of bargaining higher than the company level.

If, as is often argued, nominal ULC is a measure of wage-related competitiveness, higher-level bargaining and coordination would be crucial for resolving the imbalances in national competitiveness across Europe. Bargaining regimes characterised by higher degrees of coordination and levels of centralisation produce significantly lower nominal ULC growth. While this would have positive effects on employment in the longer term, real ULC – an important outcome from the unions’ point of view – was either not affected or was positively affected.

The macroeconomic implications of the empirical findings presented in this report have to be discussed elsewhere. However, if wage moderation was seen as a strategy to increase employment in the medium and long term while

mitigating imbalances and improving macroeconomic stability under the EMU, then the evidence from this report suggests that such a strategy would be favoured by a wage-bargaining system with a high degree of coordination. Such a strategy would mostly apply to countries where wage growth exceeded the growth of productivity.

If keeping wage shares high was seen as part of a strategy to promote demand, then the findings of this study suggest that such a strategy would be favoured by any wage bargaining system other than the pure company-level one. In the light of the great variety of wage-bargaining traditions and institutions, and further institutions contributing to macroeconomic stability in the Member States, achieving highly coordinated bargaining across the EU would inevitably result in institutional change in many countries.

Recommendations for further research

Finally, more and better data need to be collected to better assess the importance of wage-bargaining institutions on pay outcomes. Future research also needs to fully account for the heterogeneity of skills, qualifications, sectors or geographical areas when aiming to explain the impact of collective bargaining and include further, important outcomes, such as the gender pay gap. At present, systematic quantitative research on pay outcomes for different groups of workers and sectors covering the whole EU28 is only beginning. More rigorous research at the right level of aggregation is needed to improve the evidence base on institutional reform in Europe.

In addition, although this report engages thoroughly with an existing literature on wage bargaining and pay, which is firmly grounded in institutional economics, econometric research as presented in this report is necessarily limited to key institutional characteristics and outcome variables.

This study provides only a starting point for future research. Further in-depth qualitative research to qualify the importance assigned to institutional characteristics, which the authors estimated on the basis of statistical and econometric models, needs to be carried out to obtain a better understanding of the mechanisms underpinning the significant links presented in this paper.

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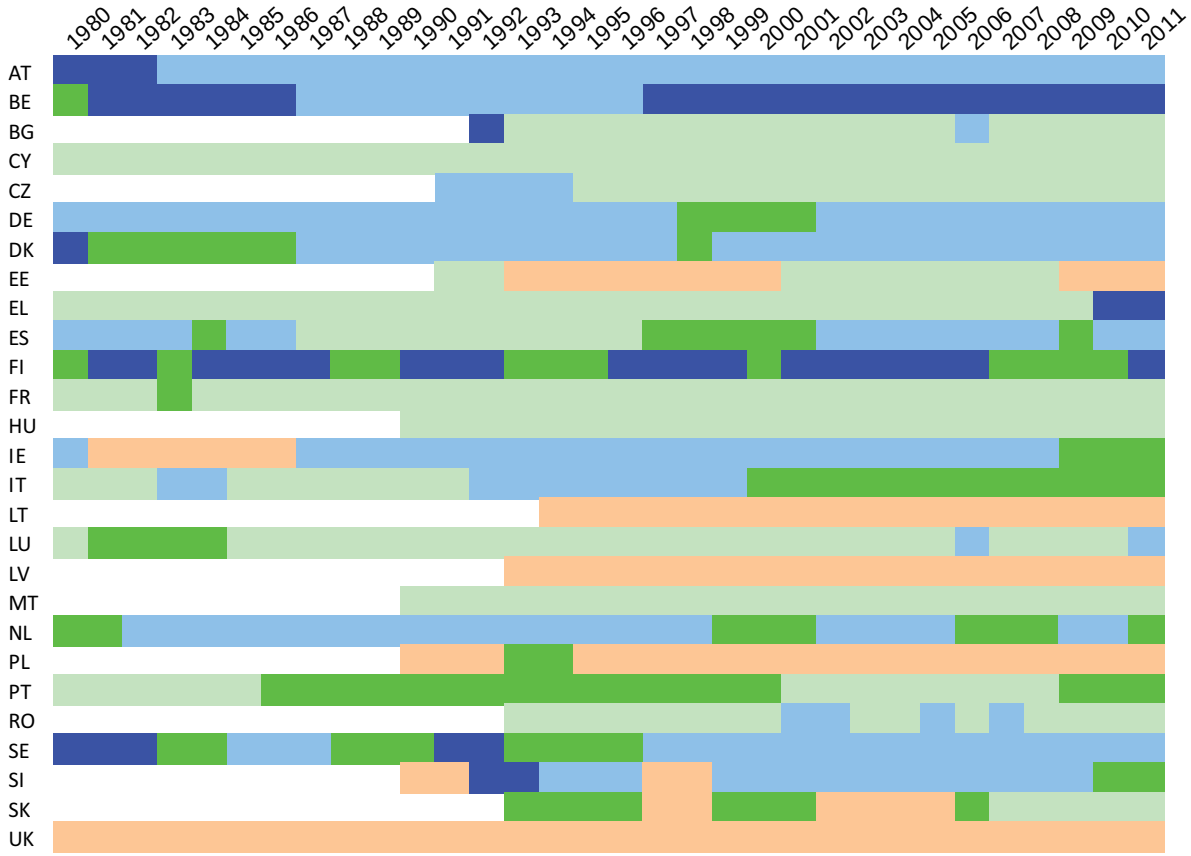
Annex 1: Original coding of wage-bargaining coordination

Figure A1: Coordination of wage bargaining



Source: *ICTWSS 4.0*

	1	Fragmented wage bargaining, confined largely to individual firms or plants (for example, the UK since 1980).
	2	Mixed industry- and firm-level bargaining, with no or little pattern bargaining and relatively weak elements of government coordination through the setting of basic pay rates (statutory minimum wage) or wage indexation (for example, France most years).
	3	a) Informal (intra-associational and/or inter-associational) centralisation of industry- and firm-level bargaining by peak associations (one side or only some unions) with or without government participation (for instance, Italy since 2000). b) Industry-level bargaining with irregular and uncertain pattern setting and only moderate union concentration (for example, Denmark 1981–1986). c) Government arbitration or intervention (for example, the UK in 1966–1968, 1972–1974).
	4	a) Centralised bargaining by peak associations with or without government involvement, and/or government imposition of a wage schedule or freeze, without peace obligation (for example, Ireland 1987–2009). b) Informal (intra-associational and/or inter-associational) centralisation of industry and firm-level bargaining by peak associations (both sides) (for example, Spain 2002–2008). c) Extensive, regularised pattern setting coupled with high degree of union concentration (for example, Germany most years).
	5	a) Centralised bargaining by peak associations, with or without government involvement, and/or government imposition of a wage schedule or freeze, with peace obligation (for example, Sweden prior to 1980). b) Informal centralisation of industry-level bargaining by a powerful and monopolistic union confederation (for instance, Austria prior to 1983. c) Extensive, regularised pattern setting and highly synchronised bargaining coupled with coordination of bargaining by influential large firms (for example, Japan prior to 1998).

Annex 2: Summary of all econometric models estimated

Table A1: Level of bargaining (base category: local or company)

		Alternating between sector/company			Predominantly sector/industry			Intermediate central/ industry		
Pay outcome	**N/R**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**
Control variables:		**Development of labour productivity, lagged unemployment rate and lagged CPI**								
Wages	**N**	.072	-.116	-.012	.273**	-.003	-.001	.345**	0	.004
	R	-.047**	-.167**	-.04	.032	-.096*	-.015	.044	-.1*	-.015
Compensation per employee	**N**	.009	.065**	.031*	-.036**	.006	-.006	.011	-.005	-.005
	R	-.03**	.022	.011	-.039**	-.001	-.003	-.038**	-.023	-.004
Compensation per hour	**N**	.052**	.084**	.1**	-.005	.013	.034	.074**	.008	.047
	R	.004	.016	.052**	-.011	-.011	.029	.011	-.032	.025
ULC	**N**	.051**	.034	.026	.064**	-.034	-.007	.072**	-.039	-.015
	R	.005	.097**	.047**	.008	.106**	.042*	-.007	.099**	.031
Wage drift	**N**	-.762	-.049	-.807	-2.456*	-4.025	.825	-1.651	-2.517	0
	R	-.72	.908	.282	-1.41**	-2.299	-3.061	-1.25	-1.209	-.897
Further control variables:		**Employment rates and labour supply (percentage of working age to all resident population)**								
Wages	**N**	-.089**			-.045**		-.002	.019	.01	.001
	R	-.101**			-.074**		-.001	-.069**	.005	-.004
Compensation per employee	**N**	.005	.096**	.022	-.032*	-.043	-.044**	-.02	-.021	-.044**
	R	-.03**	.05**	.012	-.041**	-.011	-.011	-.048**	-.008	-.011
Compensation per hour	**N**	.022	.093**	.017	-.012	-.069*	-.071**	.023	-.044	-.067**
	R	-.015	.019	-.005	-.019**	-.051**	-.033**	-.002	-.044**	-.029*
ULC	**N**	.054**	.076**	.022	.069**	-.081**	-.052**	.061**	-.056	-.056**
	R	-.019	.093**	.022	.014	.133**	.051**	-.02	.153**	.037
Wage drift	**N**	1.226			.127	-.301	-.205	-.266	.176	0**
	R	-.447			-.41	-.29	-1.049	-.371	.412	.291
Further control variables:		**Exports, human capital, ECB member, labour tax, ALMP spending, government expenditure as % of GDP**								
Wages	**N**	-.175**			.009	0**	0	.038*	.022**	0**
	R	-.136**			-.072**	0**	.008	-.061**	.007	0**
Compensation per employee	**N**	.095**			-.156**	.011	0	-.238**	.022	-.016
	R	.006			-.048**	-.023	-.015	-.095**	-.031	-.036*
Compensation per hour	**N**	.16**			-.119**	.011	-.009	-.167**	.037	.004
	R	.071**			-.011	-.023	-.028	-.025	-.017	-.023
ULC	**N**	.044			-.013	.025	.019	-.025	.034	.019
	R	.102**			.066*	.249**	.224**	.041	.26**	.232**
Wage drift	**N**	-3.446			-.424	0**	5.36*	-1.038	-4.56	0**
	R	-3.581			-5.628**	0**	1.042	-5.877**	-1.47	0**

		Central or cross-industry level			N			F/Chi2		
Pay outcome	**N/R**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**
Control variables:		**Development of labour productivity, lagged unemployment rate and lagged CPI**								
Wages	**N**	.198**	-.015	0	238	238	202	44.6	259.5	30088.3
	R	.001	-.1*	-.016	238	238	202	51.2	107.6	1828.4
Compensation per employee	**N**	-.015	-.021	-.012	523	523	495	617.6	725.3	21742.2
	R	-.023**	-.03**	-.007	524	524	498	495.3	427.8	15551.8
Compensation per hour	**N**	.013	.017	.044	461	461	423	513.6	580.5	9753.6
	R	.005	-.026	.028	461	461	423	451.1	394.7	5596.7
ULC	**N**	.072**	-.053*	-.014	524	524	498	228.6	251.7	7834.1
	R	.029*	.108**	.048**	516	516	488	10.5	16.4	818.4
Wage drift	**N**	-.803	-3.744	.807	240	240	197	5.7	3.1	49.7
	R	-.451	-1.653	-1.244	235	235	190	1.4	0.8	9.9
Further control variables:		**Employment rates and labour supply (percentage of working age to all resident population)**								
Wages	**N**	.017	.008		186	186	154	69.8	983.1	46464.5
	R	-.076**	.004		186	186	154	62.3	94.9	1668.9
Compensation per employee	**N**	-.006	-.024	-.035*	355	355	329	194.5	319.2	13611
	R	-.033**	-.024	-.007	355	355	329	161.8	239.8	12894.7
Compensation per hour	**N**	.018	-.036	-.051*	355	355	318	237.7	396.2	9525.3
	R	-.006	-.049**	-.022	355	355	318	204.8	331.4	8072.5
ULC	**N**	.073**	-.06*	-.044**	355	355	329	90.8	119.3	5069.7
	R	.039**	.145**	.063**	355	355	328	9	24.9	1077.2
Wage drift	**N**	.374		.959	188	188	152	2.1	1.3	30.1
	R	.018			183	183	145	1.3	1.6	56.7
Further control variables:		**Exports, human capital, ECB member, labour tax, ALMP spending, government expenditure as % of GDP**								
Wages	**N**	.024	.015*	0	91	91	78	200.9	194.4	13478.9
	R	-.067**	.008	.009	91	91	78	54.4	28	950.2
Compensation per employee	**N**	-.218**	.034	-.005	120	120	102	58.5	36.6	1,589.6
	R	-.068**	-.023	-.03	120	120	102	80	24.1	1155.6
Compensation per hour	**N**	-.178**	.03	.002	120	120	102	56.6	51.9	1893.7
	R	-.028	-.027	-.028	120	120	102	67.6	46.3	1569.7
ULC	**N**	-.04	.036	.031	120	120	102	22.2	20.8	848.3
	R	.048	.256**	.237**	120	120	102	5.5	7.8	220
Wage drift	**N**	-1.249	-2.96	0	95	95	79	3.6	2.2	45.3
	R	-5.531**	-1.774	#N/A	95	95	79	2.2	1.6	33

Notes: Wages, compensation (per employee/per hour) and ULC: log level (index); wage drift: percentage point difference in growth rates.

Sources: *ICTWSS 4.0 (institutions), AMECO (compensation per employee and ULC), Eurofound (collectively agreed wages), Conference Board (compensation per hour); authors' calculations*

Table A2: Coordination of bargaining (base category: fragmented)

		Mixed industry- and firm-level			Informal		
Pay outcome	**N/R**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**
Control variables:		**Development of labour productivity, lagged unemployment rate and lagged CPI**					
Wages	**N**	.092	-.127**	-.021	.2**	-.083	0
	R	.001	-.048	-.006	.028	-.035	.014
Compensation per employee	**N**	.075**	.007	-.024	.002	-.093**	-.034*
	R	-.009	.041**	.003	-.04**	-.011	-.004
Compensation per hour	**N**	.138**	.012	-.019	.069**	-.072*	-.033
	R	.038**	.015	-.01	.019*	-.015	-.001
ULC	**N**	.013	-.01	-.017	.013	-.102**	-.034*
	R	-.031**	.035	-.007	-.04**	.005	-.018
Wage drift	**N**	.129	-4.226	-1.802	-.496	-4.49	-4.018
	R	-.556	-.242	.73	-.93	-2.144	-1.56
Further control variables:		**Employment rates and labour supply (percentage of working age to all resident population)**					
Wages	**N**	.039*	-.022*	-.007	-.029	-.013	-.003
	R	-.018	.006	.016	-.044**	.019	.018*
Compensation per employee	**N**	.088**	.162**	.019	.025	.051	-.012
	R	.028**	.09**	.01	-.012	.044**	.001
Compensation per hour	**N**	.098**	.097**	.005	.038*	.008	-.016
	R	.041**	.022	-.002	.008	.002	-.016
ULC	**N**	-.051**	.11**	.015	-.027	.016	-.019
	R	-.07**	.036	-.001	-.051**	-.005	-.025
Wage drift	**N**	.837	-.4	-.056	1.393	-.156	-1.055
	R	-.429	-.383	1.771	-.164	-1.009	-.047
Further control variables:		**Exports, human capital, ECB member, labour tax, ALMP spending, government expenditure as % of GDP**					
Wages	**N**	-.002	-.005	-.01	.077**	.003	-.003
	R	-.014	.001	.009	.027*	.006	.001
Compensation per employee	**N**	.193**	.141**	.041	.038	.065	.001
	R	.082**	.074**	.033**	.041**	.049**	.018
Compensation per hour	**N**	.202**	.046	-.018	.042	.005	-.036
	R	.09**	-.022	-.025*	.044**	-.011	-.015
ULC	**N**	.04*	.082**	.005	-.013	.02	-.014
	R	-.028	0	-.001	-.094**	-.029	-.017
Wage drift	**N**	3.359	2.899	4.035	1.026	-1.579	-.706
	R	-.278	2.829	4.113	-1.424	.827	2.191

		Centralised			N			F/Chi2		
Pay outcome	**N/R**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**
Control variables:		**Development of labour productivity, lagged unemployment rate and lagged CPI**								
Wages	**N**	.207**	-.103	.006	237	237	201	41.6	270.7	28301.3
	R	.025	-.059	.011	237	237	201	48.8	107.2	1796.5
Compensation per employee	**N**	.016	-.076**	-.034*	522	522	494	725.7	879.9	21653.8
	R	-.021**	-.01	-.006	523	523	497	549.7	517.6	15781.3
Compensation per hour	**N**	.053**	-.06	-.016	460	460	422	665	692	9841.8
	R	.01	-.024	-.007	460	460	422	555.4	475.6	5811.7
ULC	**N**	.046**	-.084**	-.032*	523	523	497	252	306.8	7909.3
	R	.007	.033	-.003	516	516	488	15.2	17.8	810.7
Wage drift	**N**	-.499	-4.748	-4.905	239	239	196	6.3	3.2	49.7
	R	-1.083	-2.43	-2.227	234	234	189	0.9	0.9	10.9
Further control variables:		**Employment rates and labour supply (percentage of working age to all resident population)**								
Wages	**N**	.011	-.008	-.004	186	186	154	58.8	914.9	46244.6
	R	-.037**	.018	.014	186	186	154	30.2	88.2	1648.9
Compensation per employee	**N**	.017	.068	-.013	355	355	329	225.2	380.8	13577.1
	R	-.014	.04**	-.001	355	355	329	182.7	286.8	12985.1
Compensation per hour	**N**	.018	.016	-.021	355	355	318	279	435.5	9326.4
	R	-.006	-.008	-.017	355	355	318	245.8	353.2	7997.5
ULC	**N**	.005	.031	-.021	355	355	329	98.3	134.9	5000.6
	R	-.001	.018	-.014	355	355	328	12	25.7	1035.5
Wage drift	**N**	.861	-.453	-.736	188	188	152	2.2	1.2	29.7
	R	-.316	-1.235	-.167	183	183	145	1.3	1.4	59
Further control variables:		**Exports, human capital, ECB member, labour tax, ALMP spending, government expenditure as % of GDP**								
Wages	**N**	.094**	.021	-.003	91	91	78	78.3	181.2	13997.4
	R	.04**	.013	-.001	91	91	78	34	26.3	915.4
Compensation per employee	**N**	-.002	.079	-.004	120	120	102	83.8	43.2	1663.8
	R	.022	.042*	.001	120	120	102	116.2	28.5	1218.5
Compensation per hour	**N**	-.014	.024	-.024	120	120	102	89.4	53.5	1942.4
	R	.01	-.014	-.016	120	120	102	116.7	46.1	1552.2
ULC	**N**	-.012	.03	-.003	120	120	102	24.8	22.5	858.3
	R	-.073**	.002	.015	120	120	102	6.3	5.4	163.3
Wage drift	**N**	-.641	-4.913	-4.611	95	95	79	3.9	2.2	47.7
	R	-1.619	-.751	1.265	95	95	79	1.9	1.6	38.1

Notes: Wages, compensation (per employee/per hour) and ULC: log level (index); wage drift: percentage point difference in growth rates.
Sources: *ICTWSS 4.0 (institutions), AMECO (compensation per employee and ULC), Eurofound (collectively agreed wages), Conference Board (compensation per hour); authors' calculations*

Table A3: Type of bargaining (base category: uncoordinated)

		Pattern bargaining			Intra-associational/inter-associational		
Pay outcome	**N/R**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**
Control variables:		**Development of labour productivity, lagged unemployment rate and lagged CPI**					
Wages	**N**	-.032**	.038**	.006	.031*	.036**	-.003
	R	-.01	.012	-.012	-.021**	.009	-.018**
Compensation per employee	**N**	-.092**	-.123**	-.017	-.043**	-.139**	-.03**
	R	-.031**	-.036**	-.012**	-.039**	-.057**	-.015**
Compensation per hour	**N**	-.102**	-.156**	-.054**	-.024	-.141**	-.048**
	R	-.028**	-.067**	-.025*	-.023**	-.061**	-.029**
ULC	**N**	.043**	-.122**	-.016	.002	-.136**	-.036**
	R	.016	-.012	-.013	-.018	-.069**	-.041**
Wage drift	**N**	0.192	1.808	1.057	1.123	1.776	1.995
	R	0.16	-1.191	-2.421	0.566	-.582	-.535
Further control variables:		**Employment rates and labour supply (percentage of working age to all resident population)**					
Wages	**N**	-.04**	.016	.005	-.004	.017	.003
	R	-.029**	0	-.002	-.041**	0	-.007
Compensation per employee	**N**	-.052**	-.077**	-.025	-.027	-.117**	-.035**
	R	-.037**	-.026*	-.012*	-.034**	-.045**	-.017**
Compensation per hour	**N**	-.056**	-.093**	.032	-.028*	-.115**	-.033*
	R	-.035**	-.036**	-.03**	-.03**	-.038**	-.026**
ULC	**N**	.068**	-.068**	-.025	-.004	-.107**	-.041**
	R	.057**	0	-.01	-.014	-.065**	-.044**
Wage drift	**N**	.093	2.221	1.442	1.351	1.786	2.584
	R	-.439	-1.402	-2.992*	0.323	-1.21	-1.946
Further control variables:		**Exports, human capital, ECB member, labour tax, ALMP spending, government expenditure as % of GDP**					
Wages	**N**	.038	-.016	.005	.034	-.019	.002
	R	-.006	-.025	-.02*	.015	-.029	-.026**
Compensation per employee	**N**	-.148**	-.035	-.034	-.1**	-.048	-.036
	R	-.038*	-.005	-.003	-.018	-.001	.007
Compensation per hour	**N**	-.159**	-.038	-.045	-.135**	-.041	-.046
	R	-.049**	-.009	-.013	-.053**	.007	-.004
ULC	**N**	-.026	-.025	-.03	-.032	-.035	-.037
	R	-.025	-.047	-.036	-.066**	-.089	-.071
Wage drift	**N**	-2.408	-2.449	-1.767	-2.693	-3.906	-3.899
	R	-1.99	1.123	.409	-.306	.487	.183

		State-sponsored or state-imposed			N			F/Chi2		
Pay outcome	**N/R**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**
Control variables:		**Development of labour productivity, lagged unemployment rate and lagged CPI**								
Wages	**N**	.015	.035**	-.005	224	224	190	71.8	821.1	41699.8
	R	-.017**	.012	-.02**	224	224	190	29.5	68.6	1463.4
Compensation per employee	**N**	.031**	-.104**	-.02**	499	499	473	707.1	884.3	26237.9
	R	-.019**	-.053**	-.014**	500	500	476	530.6	503.4	20922.4
Compensation per hour	**N**	-.025*	-.102**	-.029**	437	437	401	526.6	665	12058.4
	R	-.011*	-.06**	-0.29**	437	437	401	472.5	473.2	7517.1
ULC	**N**	.022*	-.101**	-.022**	500	500	476	250.3	329.6	10394.3
	R	.02*	-.028	-.016	493	493	467	11.4	22.7	991.2
Wage drift	**N**	0.692	1.522	1.452	227	227	186	3.5	1.8	29.5
	R	0.469	-.798	-.489	222	222	179	2.1	0.9	43.7
Further control variables:		**Employment rates and labour supply (percentage of working age to all resident population)**								
Wages	**N**	-.011	.015	.001	186	186	154	53.7	887.5	47005.4
	R	-.039**	-.002	-.007	186	186	154	33.9	85.4	1701.3
Compensation per employee	**N**	-.011	-.076**	-.021*	355	355	329	214.4	361.6	13399.3
	R	-.027**	-.042**	-.014**	355	355	329	177.5	263.7	12932.4
Compensation per hour	**N**	-.012	-.076**	-.021	355	355	318	262.2	439.4	9359.2
	R	-.023**	-.036**	-.023**	355	355	318	233	357.6	8050.9
ULC	**N**	.039**	-.07**	-.024**	355	355	329	101.3	132.1	4961.4
	R	.041**	-.022	-.015	355	355	328	11.2	26.9	1042
Wage drift	**N**	1.028	2.111	2.156	188	188	152	2.5	1.3	30.2
	R	0.168	-1.284	-2.062*	183	183	145	1.5	1.5	64.1
Further control variables:		**Exports, human capital, ECB member, labour tax, ALMP spending, government expenditure as % of GDP**								
Wages	**N**	.054**	-.008	-.001	91	91	78	56.2	174	13829
	R	.012	-.024	-.023**	91	91	78	28.3	27.3	1096.4
Compensation per employee	**N**	-.12**	-.027	-.038	120	120	102	46.1	36.6	1621.2
	R	-.022	-.007	-.009	120	120	102	67.3	23.9	1241.7
Compensation per hour	**N**	-.145**	-.027	-.038	120	120	102	47.5	51.7	1927.6
	R	-.047**	-.006	-.01	120	120	102	66.2	45.8	1565.1
ULC	**N**	-.042*	-.023	-.025	120	120	102	22.5	20.7	840.5
	R	-.032	-.043	-.024	120	120	102	5.5	5.5	166
Wage drift	**N**	-2.937	-4.807	-4.281	95	95	79	3.8	2	43.4
	R	-.394	-.085	-.237	95	95	79	2	1.4	32.5

Notes: Wages, compensation (per employee/per hour) and ULC: log level (index); wage drift: percentage point difference in growth rates.
Sources: *ICTWSS 4.0 (institutions), AMECO (compensation per employee and ULC), Eurofound (collectively agreed wages), Conference Board (compensation per hour); authors' calculations*

Table A4: Mandatory extension of collective bargaining by law (base category: no extension)

		Exceptional			Used in many industries		
Pay outcome	**N/R**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**
Control variables:		**Development of labour productivity, lagged unemployment rate and lagged CPI**					
Wages	**N**	-.315**	-.069	-.004	-.1	.058	
	R	-.095**	-.018	0	-.052**	.059	
Compensation per employee	**N**	.043**	.009	-.003	-.013	-.155**	.066**
	R	.001	.025	.013	-.01	.004	-.012
Compensation per hour	**N**	.01	-.002	-.036	-.01	-.139**	-.081**
	R	-.016**	.006	-.004	-.007	.014	.006
ULC	**N**	.008	.015	.006	.015	-.136**	-.038
	R	.059**	.03	.023	.036**	.011	.025
Wage drift	**N**	3.957**	-3.518	-4.299	1.577		
	R	1.327*	-1.294	-1.634	.549		
Further control variables:		**Employment rates and labour supply (percentage of working age to all resident population)**					
Wages	**N**	-.015	-.013	.007	-.064**	.031	
	R	-.041**	-.002	-.018*	-.069**	.016	
Compensation per employee	**N**	-.029	.001	.012	-.044**	-.111*	
	R	-.046**	-.007	.003	-.028**	-.041	-.021*
Compensation per hour	**N**	-.036	-.053	-.03	-.048**	-.117**	-.049
	R	-.048**	-.061**	-.038**	-.027**	-.046*	-.04**
ULC	**N**	.054**	-.003	.018	.026	-.086	.003
	R	.034*	.017	.029	.015	.018	.066*
Wage drift	**N**	-.038	-2.206	-2.367	.923		
	R	-.398	-1.283	-3.428**	.11		
Further control variables:		**Exports, human capital, ECB member, labour tax, ALMP spending, government expenditure as % of GDP**					
Wages	**N**	-.009	-.012	.003	.119**	.031	
	R	-.043**	-.023	-.017	.013	-.032	
Compensation per employee	**N**	-.004	-.02	-.015	-.036	-.072	-.002
	R	-.024	-.054**	-.037**	-.014	-.085**	-.079**
Compensation per hour	**N**	.018	.018	.008	-.003	.013	.061
	R	-.001	-.016	-.019	.02	.001	-.006
ULC	**N**	0	.005	.006	-.013	.002	.058
	R	-.058*	-.017	-.007	-.029	0.127	.108
Wage drift	**N**	-3.808	-6.118	-6.07	1.559		
	R	-2.172	-2.772	-2.706	-.575		

		Virtually automatic			N			F/Chi2		
Pay outcome	**N/R**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**
Control variables:		**Development of labour productivity, lagged unemployment rate and lagged CPI**								
Wages	**N**	.067			237	237	201	53.8	313.8	26455.9
	R	.008			237	237	201	60.9	123.6	1729.7
Compensation per employee	**N**	-.014			522	522	494	698	971	21588.9
	R	-.031**			523	523	497	560	554.6	15631.5
Compensation per hour	**N**	.007			460	460	422	543.1	782.1	10032.5
	R	-.016**			460	460	422	522.9	534.3	5847.2
ULC	**N**	.017			523	523	497	244	336.9	7833.6
	R	-.017			516	516	488	19.2	19.7	798.5
Wage drift	**N**	.864			239	239	196	7.8	4.5	50.2
	R	-.634			234	234	189	2	0.7	6.7
Further control variables:		**Employment rates and labour supply (percentage of working age to all resident population)**								
Wages	**N**	.009			186	186	154	60.3	1015.3	45966.3
	R	-.05**			186	186	154	41.3	95.2	1647.2
Compensation per employee	**N**	-.097**			355	355	329	229.5	371.1	13194.4
	R	-.073**			355	355	329	197.2	270.1	12688.2
Compensation per hour	**N**	-.083**			355	355	318	268.8	448.9	9486.3
	R	-.054**			355	355	318	236.6	394	8501.3
ULC	**N**	.037*			355	355	329	94.1	134	4847.8
	R	-.053**			355	355	328	14.3	27	1019.2
Wage drift	**N**	.541			188	188	152	2.2	1.5	32.2
	R	-.772			183	183	145	1.5	1.7	59.9
Further control variables:		**Exports, human capital, ECB member, labour tax, ALMP spending, government expenditure as % of GDP**								
Wages	**N**	.014			91	91	78	82.9	193	13812.1
	R	-.074**			91	91	78	41.5	28.9	920.4
Compensation per employee	**N**	-.187**			120	120	102	46.1	38.8	1617.4
	R	-.076**			120	120	102	71.2	28	1217.1
Compensation per hour	**N**	-.167**			120	120	102	45.4	54.5	1828.1
	R	-.056**			120	120	102	65.5	48.5	1517
ULC	**N**	-.016			120	120	102	21.3	21.9	818.7
	R	-.035			120	120	102	5.1	6	162.8
Wage drift	**N**	1.373			95	95	79	4	2.4	45.7
	R	-3.792			95	95	79	2.1	1.7	35.9

Notes: Wages, compensation (per employee/per hour) and ULC: log level (index); wage drift: percentage point difference in growth rates.
Sources: *ICTWSS 4.0 (institutions), AMECO (compensation per employee and ULC), Eurofound (collectively agreed wages), Conference Board (compensation per hour); authors' calculations*

Table A5: Existence of a standard (institutionalised) tripartite council (base category: no permanent council)

		Council with various societal interests			Tripartite council with representation		
Pay outcome	**N/R**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**
Control variables:		**Development of labour productivity, lagged unemployment rate and lagged CPI**					
Wages	**N**	.073	-.077	-.008	.126**		
	R	.014	.005	.019	.035*		
Compensation per employee	**N**	.073**	.013	-.002	.041**	-.01	-.009
	R	0	-.012	-.011**	.013**	-.006	-.017**
Compensation per hour	**N**	.101**	.012	.054**	.019	.01	.055**
	R	.013*	-.012	.002	-.008	.028**	.038**
ULC	**N**	.026**	.009	-.001	.008	-.003	0
	R	-.028**	-.008	-.011	.017	.038*	-.007
Wage drift	**N**	-.538	-9.09*	-.36	-.499	-8.056	
	R	-.548	.834	2.331	-.636	.161	
Further control variables:		**Employment rates and labour supply (percentage of working age to all resident population)**					
Wages	**N**	.046**	-.038**	-.014**	-.025		
	R	-.05**	.005	.024**	-.049**		
Compensation per employee	**N**	.056**	.02	-.012	-.01	-.004	-.021
	R	-.003	.004	-.006	-.004	-.008	-.013**
Compensation per hour	**N**	.067**	.037	.015	-.027*	.018	.018
	R	.007	.008	.002	-.02**	.011	-.009
ULC	**N**	-.021	.018	-.01	-.021*	.001	-.007
	R	-.074**	-.056**	-.027	.009	.043	.025
Wage drift	**N**	1.636*	2.974		2.156**	1.883	
	R	.678	2.755		.449	2.75	
Further control variables:		**Exports, human capital, ECB member, labour tax, ALMP spending, government expenditure as % of GDP**					
Wages	**N**	.037	-.049**	-.022**	.081**		
	R	-.002	-.001	.013	.027		
Compensation per employee	**N**	.185**		.001	.058	-.102**	
	R	.068**		.039**	.034**	-.068**	
Compensation per hour	**N**	.239**		-.038	.056	-.027	
	R	.122**		-.003	.032*	.007	
ULC	**N**	.029		-.012	-.015	-.045	
	R	-.057		-.044	-.034	.058	
Wage drift	**N**	.945	-1.263	0**	-.355		
	R	-.274	1.178	0**	1.28		

		N			F/Chi2		
Pay outcome	**N/R**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**
Control variables:		**Development of labour productivity, lagged unemployment rate and lagged CPI**					
Wages	**N**	237	237	201	50.8	409.9	27157.8
	R	237	237	201	61.9	162.6	1696.5
Compensation per employee	**N**	522	522	494	846.9	946.7	21541.8
	R	523	523	497	628.8	546.3	15337.6
Compensation per hour	**N**	460	460	422	749.6	756.1	9823.5
	R	460	460	422	606.1	529.6	5977.9
ULC	**N**	523	523	497	287.2	326.3	7831.6
	R	515	515	487	17.2	20.5	801.6
Wage drift	**N**	239	239	196	6.9	4.5	49.7
	R	234	234	189	1.2	0.5	6.5
Further control variables:		**Employment rates and labour supply (percentage of working age to all resident population)**					
Wages	**N**	186	186	154	68.4	1136.8	47768.2
	R	186	186	154	38.5	105.7	1694
Compensation per employee	**N**	355	355	329	246.7	364.7	13140
	R	355	355	329	178.8	268.3	12472.4
Compensation per hour	**N**	355	355	318	322.6	445.8	9380.8
	R	355	355	318	255.2	377.9	7918.6
ULC	**N**	355	355	329	101.8	132.5	4864.4
	R	355	355	328	15.3	30.7	1044.1
Wage drift	**N**	188	188	152	3.1	1.4	29.7
	R	183	188	145	1.6	1.7	55.1
Further control variables:		**Exports, human capital, ECB member, labour tax, ALMP spending, government expenditure as % of GDP**					
Wages	**N**	91	91	78	67.7	217.5	16177.6
	R	91	91	78	31.6	29.5	925.7
Compensation per employee	**N**	120	120	102	49	43.5	1633.2
	R	120	120	102	76.3	30.5	1204.8
Compensation per hour	**N**	120	120	102	52.3	58.2	1873.5
	R	120	120	102	84.8	50.9	1522.1
ULC	**N**	120	120	102	23.4	23.6	839.9
	R	120	120	102	5.2	6	158.9
Wage drift	**N**	95	95	79	3.9	2.2	42.9
	R	95	95	79	2	1.5	33.2

Notes: Wages, compensation (per employee/per hour) and ULC: log level (index); wage drift: percentage point difference in growth rates.
Sources: *ICTWSS 4.0 (institutions), AMECO (compensation per employee and ULC), Eurofound (collectively agreed wages), Conference Board (compensation per hour); authors' calculations*

Table A6: Opening clauses (base category: no sectoral/national agreements, hence no opening clauses)

		Generalised/widespread			Limited		
Pay outcome	**N/R**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**
Control variables:		**Development of labour productivity, lagged unemployment rate and lagged CPI**					
Wages	**N**	-.097**		-.003	-.047**	-.006	.009*
	R	-.09**			-.068**	.001	.005
Compensation per employee	**N**	-.06**	-.027	-.004	-.045**	.012	.002
	R	-.043**	-.002	.003	-.038**	-.012	0
Compensation per hour	**N**	-.01	-.003	-.014	-.013	.036	.008
	R	-.001	-.02	.001	-.017*	-.031	-.009
ULC	**N**	.051**	-.058*	-.005	.075**	-.021	.001
	R	.028*	.09**	.039**	.046**	.098**	.044**
Wage drift	**N**	1.365*	-.356	-.422	1.189		
	R	.573	1.528	1.303	.243		
Further control variables:		**Employment rates and labour supply (percentage of working age to all resident population)**					
Wages	**N**	-.059**		.005	-.043**	-.01	.01
	R	-.071**		0	-.088**	-.001	0
Compensation per employee	**N**	.001	.007	-.008	-.022	.049	-.005
	R	-.025**	.015	.007	-.035**	.019	.001
Compensation per hour	**N**	.018	-.003	-.051	-.01	.04	-.036
	R	-.007	-.016	-.006	-.021**	-.011	-.019
ULC	**N**	.074**	-.015	-.014	.065**	.019	-.008
	R	.041**	.111**	.033	.028*	.113**	.042**
Wage drift	**N**	-.093		-2.187	1.006	-.546	-.797
	R	-.557		-2.65	-.141	-1.748	-1.409
Further control variables:		**Exports, human capital, ECB member, labour tax, ALMP spending, government expenditure as % of GDP**					
Wages	**N**	-.086**	.01	.005	-.044		.008
	R	-.102**	.017	-.007	-.096**		-.02**
Compensation per employee	**N**	-.058	-.055	-.027	-.007	.025	-.009
	R	-.042**	-.052	-.027	-.006	-.022	-.024
Compensation per hour	**N**	.001	-.033	-.031	.043	.018	-.013
	R	.017	-.031	-.037	.044*	-.029	-.031*
ULC	**N**	.013	-.029	-.017	.023	.027	.018
	R	.074**	.21**	.171**	.125**	.243**	.214**
Wage drift	**N**	-2.583	-3.132		-1.091		3.554
	R	-5.697**	-.934	1.652	-3.785**		2.776

		Exceptional			N			F/Chi2		
Pay outcome	**N/R**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**
Control variables:		**Development of labour productivity, lagged unemployment rate and lagged CPI**								
Wages	**N**	.026*	-.035**		224	224	190	112.1	983.7	42451.9
	R	-.053**	-.02*	.02**	224	224	190	67	83	1422
Compensation per employee	**N**	-.037**	-.002	-.007	499	499	473	671.6	793.9	25936.7
	R	-.055**	-.018	-.004	500	500	476	551.9	455.1	20668.4
Compensation per hour	**N**	.027	.048	-.001	437	437	401	483.7	604.3	11663.4
	R	-.004	-.011	-.006	437	437	401	459	439.8	7421.3
ULC	**N**	.067**	-.046	-.013	500	500	476	260.5	290.4	10204.8
	R	-.017	.062*	.029	493	493	467	16.2	22.5	989.7
Wage drift	**N**	.866	.032	-.305	227	227	186	3.7	1.9	29.3
	R	-.131	1.067	1.312	222	222	179	2.3	1.3	40.7
Further control variables:		**Employment rates and labour supply (percentage of working age to all resident population)**								
Wages	**N**	.029	-.03**		186	186	154	75.7	1015.5	47177.2
	R	-.074**	-.015		186	186	154	66.5	96.2	1653.6
Compensation per employee	**N**	-.021	.082**	-.013	355	355	329	209.9	342.4	13145.8
	R	-.048**	.028	-.011	355	355	329	179.8	244.6	12857.5
Compensation per hour	**N**	.012	.076**	-.055*	355	355	318	257	417.6	9140.7
	R	-.014	.001	-.018	355	355	318	222.8	344.9	7960.4
ULC	**N**	.055**	.044	-.014	355	355	329	99.4	122.9	4862
	R	-.045**	.102**	.024	355	355	328	14	26.8	1054.3
Wage drift	**N**	.243	-1.333		188	186	152	2.3	1.3	29.3
	R	-.828	-1.481		183	183	145	1.6	1.7	56.2
Further control variables:		**Exports, human capital, ECB member, labour tax, ALMP spending, government expenditure as % of GDP**								
Wages	**N**	-.009	-.01		91	91	78	73.7	184.8	14244.8
	R	-.08**	.02*		91	91	78	45.1	29.2	948.8
Compensation per employee	**N**	-.056	.003	-.046	120	120	102	41.8	37.6	1636.4
	R	-.036*	-.026	-.03	120	120	102	69.3	24.8	1160.7
Compensation per hour	**N**	.004	-.016	-.055	120	120	102	40.3	52.2	1962.6
	R	.024	-.046	-.044**	120	120	102	60.8	46.7	1640.9
ULC	**N**	-.004	-.01	-.025	120	120	102	21.6	21.2	886.6
	R	-.005	.178**	.131**	120	120	102	8.3	8.3	243.1
Wage drift	**N**	-2.026	-5.262	-3.095	95	95	79	3.7	2.2	46.7
	R	-6.082**	-2.822*		95	95	79	2.5	1.6	35.4

Notes: Wages, compensation (per employee/per hour) and ULC: log level (index); wage drift: percentage point difference in growth rates.
Sources: *ICTWSS 4.0 (institutions), AMECO (compensation per employee and ULC), Eurofound (collectively agreed wages), Conference Board (compensation per hour); authors' calculations*

Table A7: Social pact proposed by government, unions or employers (base category: none)

		Yes			N			F/Chi2		
Pay outcome	**N/R**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**
Control variables:		**Development of labour productivity, lagged unemployment rate and lagged CPI**								
Wages	**N**	.181**	.023	.008**	236	236	200	59.5	373	25333.2
	R	.034*	-.003	-.002	236	236	200	69.3	146.6	1737.3
Compensation per employee	**N**	.023	.011	-.004	521	521	493	955.5	1138.7	21508.7
	R	-.001	-.001	-.003	522	522	496	732.6	658.6	15731
Compensation per hour	**N**	.016	.006	0	459	459	421	763.6	918.3	9754.9
	R	-.007	-.006	-.004	459	459	421	723	640.8	5807.4
ULC	**N**	.017	.01	-.005	522	522	496	341.3	395.1	7818.3
	R	.01	.014	.006	515	515	487	15.8	23.7	805.7
Wage drift	**N**	-1.872	-1.022	-2.11*	238	238	195	9.3	4.4	52.9
	R	-1.278**	-1.073	-1.421*	233	233	188	1.9	1.1	9.7
Further control variables:		**Employment rates and labour supply (percentage of working age to all resident population)**								
Wages	**N**	-.002	-.003	-.002	186	186	154	63	1085.5	47749.1
	R	-.021**	-.008**	-.003	186	186	154	33.8	110.4	1687.5
Compensation per employee	**N**	.014	.011	.001	355	355	329	257	406.5	13290.4
	R	-.004	-.003	-.002	355	355	329	199.4	298.3	12836.6
Compensation per hour	**N**	.008	.007	-.001	355	355	318	312.4	494.2	9234.9
	R	-.009	-.008	-.004	355	355	318	270.5	424	8003.9
ULC	**N**	.008	.009	0	355	355	329	112.3	147.7	4909.9
	R	-.004	-.006	-.003	355	355	328	10.2	30.2	1022.6
Wage drift	**N**	.572	.016	-.376	188	188	152	2.7	1.5	30.4
	R	-.048	-.551	-.897**	183	183	145	1.6	1.8	62.4
Further control variables:		**Exports, human capital, ECB member, labour tax, ALMP spending, government expenditure as % of GDP**								
Wages	**N**	.006	.004	0	91	91	78	57.7	194.3	14497.2
	R	-.005	-.003	-.004	91	91	78	31	29.8	928.3
Compensation per employee	**N**	.012	-.007	-.011	120	120	102	46.3	41	1673.1
	R	.007	-.008	-.009**	120	120	102	73.6	27.4	1252.3
Compensation per hour	**N**	.011	-.002	-.007	120	120	102	45.1	57.9	1958
	R	.006	-.002	-.005	120	120	102	66	50.8	1585.4
ULC	**N**	-.004	-.003	-.009	120	120	102	23.9	23.3	862.4
	R	-.003	-.005	-.008	120	120	102	5.3	5.8	160.4
Wage drift	**N**	-.729	-.576	-.525	95	95	79	4.2	2.2	43.9
	R	-.768	-.839	-.853	95	95	79	2.1	1.7	35.7

Notes: Wages, compensation (per employee/per hour) and ULC: log level (index); wage drift: percentage point difference in growth rates.
Sources: *ICTWSS 4.0 (institutions), AMECO (compensation per employee and ULC), Eurofound (collectively agreed wages), Conference Board (compensation per hour); authors' calculations*

Table A8: Interaction of coordination and bargaining level (base: mixed industry- and firm-level/informal; intermediate)

		Fragmented; local or company/ intermediate			Mixed industry- and firm-level/informal; local or company			Mixed industry- and firm-level/informal; centralised		
Pay outcome	**N/R**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**
Control variables:		**Development of labour productivity, lagged unemployment rate and lagged CPI**								
Wages	**N**	-.186**	.116*	.012	-.341**			-.039	.078	.019
	R	-.015	.044	-.004	-.037			-.001	.025	.067**
Compensation per employee	**N**	-.04**	.049	.025	.067**	-.117**	-.065**	-.044	-.041	.009
	R	.029**	-.018	-.001	.048**	-.003	-.015	-.008	-.015	.01
Compensation per hour	**N**	-.1**	.038	.029	.059**	.001	.032	.02	-.046	.022
	R	-.016**	.001	.007	.043**	.06**	.034	.065**	-.014	.027*
ULC	**N**	-.036**	.065*	.022	-.087**	-.063	-.058*	-.051**	-.049	-.001
	R	.026*	-.028	.008	-.015	-.276**	-.133**	-.054**	-.009	.01
Wage drift	**N**	.86	4.295	2.845	3.242**			1.487	6.885	2.762
	R	.876	.72	1.413	1.232			-.336	1.355	-.61
Further control variables:		**Employment rates and labour supply (percentage of working age to all resident population)**								
Wages	**N**	-.005	.02*	.006	.101**			.12**	-.033*	
	R	.047**	-.009	-.015	.12**			.045**	-.014	
Compensation per employee	**N**	-.042**	-.11**	-.001	.093**	-.017	-.02	-.037	-.018	.006
	R	.008	-.067**	-.003	.067**	.018	-.002	.003	.003	.018**
Compensation per hour	**N**	-.053**	-.055	.005	.082**	.04	.052*	.025	-.018	.043*
	R	-.007	-.011	.009	.055**	.071**	.044**	.067**	.008	.021*
ULC	**N**	.001	-.066	.004	-.126**	.033	-.011	-.037*	-.017	0
	R	.046**	-.019	.011	-.03	-.229**	-.108**	-.058**	.023	.002
Wage drift	**N**	-1.625	.446	.343	.159			-2.488*	1.267	
	R	-.063	.694	-.693	.867			-.585	1.807	
Further control variables:		**Exports, human capital, ECB member, labour tax, ALMP spending, government expenditure as % of GDP**								
Wages	**N**	.017	.001	.006	.201**			.144**		
	R	.019	-.003	-.004	.072*			.047**		
Compensation per employee	**N**	-.074*	-.116**	-.024	.114**	-.008	-.001	.022		
	R	-.048**	-.066**	-.027*	.033*	.025	.014	-.006		
Compensation per hour	**N**	-.068	-.032	.025	.151**	-.009	.009	.143**		
	R	-.042**	.018	.021	.07**	.024	.029*	.115**		
ULC	**N**	-.031	-.061	.003	-.026	-.022	-.021	-.024		
	R	-.018	.014	.015	-.158**	-.249**	-.226**	-.101**		
Wage drift	**N**	-.078	-.707	-1.532	4.494			5.666		
	R	1.217	-1.849	-2.886	-.101			-2.607		

		Centralised; local or company			Centralised; intermediate			Centralised; centralised		
Pay outcome	**N/R**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**
Control variables:		**Development of labour productivity, lagged unemployment rate and lagged CPI**								
Wages	**N**				-.001	.007	.025**	.05	-.005	.007
	R				.008	-.028*	.02**	.012	-.008	.002
Compensation per employee	**N**	-.204*	-.414**	-.081	-.052**	-.009	0	.002	-.023	-.01
	R	-.034	-.129**	-.031	0	.005	.002	.013*	-.032**	-.008*
Compensation per hour	**N**	-.471**	-.532**	-.118	-.075**	-.013	.025*	-.015	.005	.017
	R	-.271**	-.284**	-.12**	-.014**	0	.013	.001	-.016*	0
ULC	**N**	-.373**	-.34**	-.056	.009	-.008	-.001	.026**	-.013	-.012
	R	-.02	-.306**	-.152**	.031**	.019	.019*	.038**	-.011	-.006
Wage drift	**N**				.023	-.505	-2.951	.739	.974	.099
	R				-.689	-2.484**	-4.134**	.321	.713	1.695
Further control variables:		**Employment rates and labour supply (percentage of working age to all resident population)**								
Wages	**N**				-.014	-.001	-.005	.061**	.008	.002
	R				.009	-.008	-.007	.008	.004	-.002
Compensation per employee	**N**	-.148	-.154*	.016	-.051**	-.011	-.01	.003	.013	-.005
	R	-.028	.001	.027	-.013*	-.004	-.003	-.004	-.013*	-.003
Compensation per hour	**N**	-.381**	-.291**	-.053	-.054**	-.013	0	.001	.022	.004
	R	-.261**	-.139**	-.055*	-.014*	-.004	.003	-.004	-.001	.006
ULC	**N**	-.313**	-.074	.048	.025**	-.008	-.01	.02	.017	-.007
	R	-.035	-.168*	-.059	.045**	0	.001	.048**	.001	-.002
Wage drift	**N**				-1.067	-1.121	-.36	-.326	.314	.788
	R				-.578	-1.396	-1.78**	.206	.428	1.06
Further control variables:		**Exports, human capital, ECB member, labour tax, ALMP spending, government expenditure as % of GDP**								
Wages	**N**				.001			.03**	.081**	-.001
	R				-.05			.018*	.008	-.002
Compensation per employee	**N**				-.084*			-.112**	.014	-.007
	R				-.036**			-.037**	-.005	-.017**
Compensation per hour	**N**				-.112**			-.11**	.018	.012
	R				-.063**			-.035**	-.001	.001
ULC	**N**				-.01			-.038**	.008	.01
	R				-.022			-.047**	.008	.011
Wage drift	**N**				-1.387			-1.773	-3.42	-3.96
	R				-4.865**			-.641	-1.616	-.982

		N			F/Chi2		
Pay outcome	**N/R**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**
Control variables:		**Development of labour productivity, lagged unemployment rate and lagged CPI**					
Wages	**N**	237	237	201	37.1	234.9	27805.2
	R	237	237	201	37.9	93.6	1844.2
Compensation per employee	**N**	522	522	494	512.3	591.5	21538.5
	R	523	523	497	393	347.1	15533.5
Compensation per hour	**N**	460	460	422	489.6	509	9879.1
	R	460	460	422	455.1	378.9	5904.9
ULC	**N**	523	523	497	195.7	205.5	7818.6
	R	516	516	488	11.4	15.4	843
Wage drift	**N**	239	239	196	5.5	3	49.2
	R	234	234	189	1.2	1	16.6
Further control variables:		**Employment rates and labour supply (percentage of working age to all resident population)**					
Wages	**N**	186	186	154	65	851.9	46779.3
	R	186	186	154	47.9	79.9	1634.6
Compensation per employee	**N**	355	355	329	187	266.7	13131.6
	R	355	355	329	150.4	200.9	12571.4
Compensation per hour	**N**	355	355	318	238.2	338.4	9320.4
	R	355	355	318	235.9	308.9	7938.7
ULC	**N**	355	355	329	94.2	95.7	4838.3
	R	355	355	328	10	23	1093.4
Wage drift	**N**	188	188	152	2.2	1.1	29
	R	183	188	145	1.5	1.5	60.6
Further control variables:		**Exports, human capital, ECB member, labour tax, ALMP spending, government expenditure as % of GDP**					
Wages	**N**	91	91	78	96.6	192	13297.1
	R	91	91	78	37.3	28	859
Compensation per employee	**N**	120	120	102	56	40.7	1577.3
	R	120	120	102	92.6	28	1143.4
Compensation per hour	**N**	120	120	102	63	52.4	1870.3
	R	120	120	102	129.3	46.4	1622.5
ULC	**N**	120	120	102	20.3	21.5	833.6
	R	120	120	102	7.1	7.8	218.1
Wage drift	**N**	95	95	79	3.6	2.2	43
	R	95	95	79	2.2	1.6	34.1

Notes: Wages, compensation (per employee/per hour) and ULC: log level (index); wage drift: percentage point difference in growth rates.
Sources: *ICTWSS 4.0 (institutions), AMECO (compensation per employee and ULC), Eurofound (collectively agreed wages), Conference Board (compensation per hour); authors' calculations*

Table A9: Type of coordination and bargaining level (base: pattern/intra-/inter-associational; intermediate)

		Uncoordinated; local or company			Uncoordinated; intermediate			Uncoordinated; centralised		
Pay outcome	**N/R**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**
Control variables:		**Development of labour productivity, lagged unemployment rate and lagged CPI**								
Wages	**N**	-.045**	-.028*	-.008	.14**	-.05**	.021**			
	R	-.027**	.006	.01	.037**	-.036*	.038**			
Compensation per employee	**N**	.064**	.136**	.021*	.059	.091	.058*	.023	-.052	.002
	R	.017**	.052**	.01**	.034**	.054	.053**	.044*	.009	.003
Compensation per hour	**N**	.08**	.155**	.055**	.136**	.017	.044	-.012	-.03	.017
	R	.017**	.065**	.027**	.11**	-.014	.034	.01	.012	.014
ULC	**N**	.004	.136**	.028**	-.021	.067	.032	-.13**	-.009	.006
	R	.001	.025	.017	-.071**	.121*	.07*	-.111**	-.153**	-.067**
Wage drift	**N**	.625	-.648	-.267	-2.00	2.365	.245	7.295*		10.866**
	R	-.09	.392	.57	-1.042	1.679	1.223	-1.244		
Further control variables:		**Employment rates and labour supply (percentage of working age to all resident population)**								
Wages	**N**	-.052**	-.009	-.006	.094**	-.038*				
	R	-.023**	.007	.005	.022**	-.018				
Compensation per employee	**N**	.053**	.11**	.031**	.003	.152**		.023	.001	.036*
	R	.024**	.043**	.015**	.026*	.126**		.046**	.008	.013
Compensation per hour	**N**	.05**	.119**	.039**	.079**	.056		-.005	-.022	.051*
	R	.013	.043**	.025**	.101**	.03		.016	.014	.023
ULC	**N**	.008	.109**	.038**	-.033	.107		-.102**	.038	.046**
	R	-.024	.013	.019	-.096**	.212**		-.122**	-.139**	-.043*
Wage drift	**N**	1.155	.671	1.046	-2.217	1.569		8.902**	11.528**	13.206**
	R	.039	1.203	1.598	-.761	2.059		.203		-.54
Further control variables:		**Exports, human capital, ECB member, labour tax, ALMP spending, government expenditure as % of GDP**								
Wages	**N**	-.119**	.019	-.001	.046*					
	R	-.041**	.029	.026**	.01					
Compensation per employee	**N**	.236**	.011	.037	-.014			.191**	-.006	.005
	R	.031	-.009	.003	-.028			.059**	.027	.018
Compensation per hour	**N**	.258**	.038	.056	.079			.227**	-.015	.009
	R	.053**	.018	.022	.065**			.095**	.018	.026
ULC	**N**	.081**	.015	.023	-.007			-.007	-.023	-.017
	R	.095**	.041	.027	-.067**			-.251**	-.249**	-.224**
Wage drift	**N**	-.15	3.998	3.916	5.60					
	R	1.448	-.449	-.243	-.594					

		Pattern/intra-/inter-associational; local or company			Pattern/intra-/inter-associational; centralised			State, intermediate		
Pay outcome	**N/R**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**
Control variables:		**Development of labour productivity, lagged unemployment rate and lagged CPI**								
Wages	**N**	.053**			.152**	.009	.008	.007	-.005	-.005
	R	.067			.016	-.011	-.015	-.008	-.002	-.005
Compensation per employee	**N**	.081**	.095**	.012	.061*	-.022	-.019	.019	.038*	-.002
	R	.056**	.04**	.007	-.042**	-.044**	-.011*	-.018*	.001	-.004
Compensation per hour	**N**	.046**	.148**	.034	.125**	.019	.012	.066**	.063**	.023*
	R	.021**	.109**	.049**	-.049**	-.03	-.002	0	.014	-.003
ULC	**N**	-.059**	.128**	.017	.026	-.006	-.024*	-.022	.043**	.002
	R	-.006	-.044	-.012	-.028	-.061**	-.039**	-.011	.004	.004
Wage drift	**N**	-1.171	-12.224**		.395	1.084	-1.104	.039	-.825	-1.01
	R	-.366	.332	1.675	.076	.993	.055	-.414	-.503	-.622
Further control variables:		**Employment rates and labour supply (percentage of working age to all resident population)**								
Wages	**N**	.037**			.117**	.017*	.008	-.026	-.005	-.004
	R	.073**			.013	.012	-.009	-.013*	-.003	-.002
Compensation per employee	**N**	.041**	.073*	.027	.074*	.013	-.023	.046*	.038**	.004
	R	.047**	.01	.007	-.058**	-.007	-.009	-.002	.008	-.004
Compensation per hour	**N**	.026	.105**	.056	.073*	.02	-.016	.053**	.046**	.013
	R	.028**	.064**	.057**	-.059**	.003	.003	.005	.014	.004
ULC	**N**	-.057**	.092**	.036	.004	.019	-.032*	.008	.037**	.009
	R	-.005	-.062	.001	-.054*	-.019	-.05**	-.015	.003	.006
Wage drift	**N**	-.262			-.268	-.818	-1.464	.116	-.363	-.855
	R	.408	.145		-.558	-.436	-.868	-.477	-.632	-.866
Further control variables:		**Exports, human capital, ECB member, labour tax, ALMP spending, government expenditure as % of GDP**								
Wages	**N**	.025			.054**	.034**	.009	-.039**	.011	-.003
	R	.088**			.044**	.018	-.001	-.024*	.005	.003
Compensation per employee	**N**	.18*			-.161**	-.007	-.025	.125**	-.012	-.001
	R	.049**			-.095**	-.025	-.033*	.02	-.016	-.008
Compensation per hour	**N**	.15**			-.148**	.049	.029	.154**	.012	.018
	R	.019			-.082**	.03	.018	.049**	.008	.009
ULC	**N**	.033			.004	.009	.003	.03	-.005	0
	R	-.001			.032	.019	.011	.026	.014	.014
Wage drift	**N**	5.622			-4.181	-6.55	-7.548*	-1.943	-.826	-.263
	R	4.971**			-1.92	-2.705	-2.607	-.177	-.541	-.393

		State; centralised			N			F/Chi2		
Pay outcome	**N/R**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**	**OLS**	**FE**	**DP**
Control variables:		**Development of labour productivity, lagged unemployment rate and lagged CPI**								
Wages	**N**	.045**	.003	-.003	224	224	190	89	640.1	42658.6
	R	.003	.007	0	224	224	190	49.1	55.2	1475.3
Compensation per employee	**N**	.045**	.014	.005	499	499	473	444.1	562.1	26152
	R	.022**	-.007	.003	500	500	476	371.4	325.2	21006.3
Compensation per hour	**N**	.042**	.03*	.02*	437	437	401	334.1	428.5	12009.5
	R	.02**	-.002	.007	437	437	401	335.9	310.9	7518.7
ULC	**N**	.013	.019	.005	500	500	476	166.4	208.6	10402.5
	R	.025**	.016	.014	493	493	467	8.4	16.1	1022
Wage drift	**N**	-.025	.432	1.434	227	227	186	3.2	2.4	37.8
	R	.369	.81	2.95**	222	222	179	1.6	.8	50.5
Further control variables:		**Employment rates and labour supply (percentage of working age to all resident population)**								
Wages	**N**	.038**	.004	.001	186	186	154	66.3	776.5	47613.9
	R	-.006	.001	.001	186	186	154	56.2	73.1	1657.5
Compensation per employee	**N**	.026*	.027*	.011	355	355	329	157.8	260.9	13399.3
	R	.012*	-.004	.005	355	355	329	139	200	13157
Compensation per hour	**N**	.03*	.032**	.017	355	355	318	193.7	321.2	9385.7
	R	.016**	.003	.009	355	355	318	194.4	262.4	8020.4
ULC	**N**	.01	.028*	.011	355	355	329	72.8	95.4	4982.8
	R	.024*	.022	.015	355	355	328	8.6	21.2	1066.7
Wage drift	**N**	.375	.899	1.224	188	188	152	2.2	1.5	42.6
	R	.566	.925	2.045**	183	183	145	1.3	1.3	74.7
Further control variables:		**Exports, human capital, ECB member, labour tax, ALMP spending, government expenditure as % of GDP**								
Wages	**N**	.02	.01	-.005	91	91	78	90.7	177.8	13133.6
	R	.001	.002	-.003	91	91	78	47.4	26.4	1037
Compensation per employee	**N**	-.04	.027	-.003	120	120	102	54.5	32.9	1536.3
	R	-.009	.004	-.012	120	120	102	75.3	22	1131.7
Compensation per hour	**N**	-.037	.012	.005	120	120	102	57.3	46.8	1822.2
	R	-.006	-.011	-.004	120	120	102	79.9	42.8	1595.4
ULC	**N**	-.029	.011	.011	120	120	102	19.6	18.5	812.8
	R	-.024	.004	.011	120	120	102	8.7	7	212.2
Wage drift	**N**	-1.313	-2.429	-2.629	95	95	79	3.6	2.1	46.1
	R	.643	-1.238	-.708	95	95	79	2.2	1.4	32.6

Notes: Wages, compensation (per employee/per hour) and ULC: log level (index); wage drift: percentage point difference in growth rates.
Sources: *ICTWSS 4.0 (institutions), AMECO (compensation per employee and ULC), Eurofound (collectively agreed wages), Conference Board (compensation per hour); authors' calculations*

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National wage-bargaining institutions are crucial in achieving pay outcomes that help to increase employment and economic growth within the context of avoiding macroeconomic imbalances within the European Monetary Union. Using a large set of empirical macroeconomic data from a variety of sources, including Eurofound and the European Commission AMECO database, this report analyses how the institutional features of national wage-bargaining regimes influence pay outcomes. These features include bargaining level, type and level of coordination, use of opening clauses and the existence of wage pacts. The impact of government intervention through extension and derogation clauses and tripartite councils is also examined. The results of the study indicate that the key institutional variables of the wage-bargaining regime that influence pay outcomes are the type of coordination (how coordination is achieved) and the bargaining level.

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